



**INDIAN AGRICULTURAL
RESEARCH INSTITUTE, NEW DELHI**

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GIPNLK—4/JDIARI/60—16-3-61—5,000

INTERNATIONAL REVIEW OF AGRICULTURE

PUBLISHED

BY THE

INTERNATIONAL INSTITUTE OF AGRICULTURE



XXXIth Year — No. 1 ⁶ January, 1940

ROME

VILLA UMBERTO I

1940

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INTERNATIONAL REVIEW OF AGRICULTURE

PUBLISHED

BY THE

INTERNATIONAL INSTITUTE OF AGRICULTURE



XXXIth Year — No. 2 — February, 1940

ROME
VILLA UMBERTO I
1940

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INTERNATIONAL REVIEW OF AGRICULTURE

PUBLISHED

BY THE

INTERNATIONAL INSTITUTE OF AGRICULTURE



XXXIth Year — No. 3 — March 1940

ROME
VILLA UMBERTO I

1940

The reproduction either in whole or in part of material printed in the Review is permitted, but only on the express condition that the source is duly acknowledged as follows: *International Review of Agriculture (International Institute of Agriculture)*.

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Rye.	243 S		
Barley	244 S	PRICES.	
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INTERNATIONAL REVIEW OF AGRICULTURE

PUBLISHED

BY THE

INTERNATIONAL INSTITUTE OF AGRICULTURE



XXXIth Year — No. 4 — April 1940

ROME

VILLA UMBERTO I

1940

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Wheat flour	306 S	STOCKS.	
Oats	307 S	Stocks of cereals, potatoes,	
Maize	307 S	cotton, etc.	313 S
Rice	308 S	PRICES.	
Linseed	308 S	Prices by products	316 S
Cotton	309 S	Average monthly prices by	
Wool	309 S	countries	256 S
Butter	310 S	APPENDIX.	
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INTERNATIONAL REVIEW OF AGRICULTURE

PUBLISHED

BY THE

INTERNATIONAL INSTITUTE OF AGRICULTURE



XXXIth Year — No. 5 — May 1940

ROME

VILLA UMBERTO I

1940

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Vines	336 S
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Cotton	337 S
Hemp	338 S
Tobacco	338 S
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Wheat	372 S
Rye.	372 S
Barley	373 S
Wheat flour	373 S
Oats	374 S
Maize	374 S

Rice	375 S	STOCKS.	
Linseed	375 S		
Cotton	376 S	Stocks of cereals, potatoes	
Wool	376 S	cotton, etc.	380 S
Butter	377 S		
Cheese	377 S	PRICES.	
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Tea	379 S	Index-numbers of prices of	
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INTERNATIONAL REVIEW OF AGRICULTURE

PUBLISHED

BY THE

INTERNATIONAL INSTITUTE OF AGRICULTURE



XXXIth Year — No. 6 — June 1940

ROME
VILLA UMBERTO I

1940

The reproduction either in whole or in part of material printed in the Review is permitted, but only on the express condition that the source is duly acknowledged as follows: *International Review of Agriculture (International Institute of Agriculture)*.

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TRADE.		Cacao	440 S
Wheat	434 S	Coffee	440 S
Rye	434 S	Tea	441 S
Barley	435 S	Total wheat and flour . . .	441 S
Wheat flour	435 S	STOCKS.	
Oats	436 S	Stocks of cereals, potatoes,	
Maize	436 S	cotton, etc.	442 S
Rice	437 S	PRICES.	
Linseed	437 S	Prices by products	444 S
Cotton	438 S	Average monthly prices by	
Wool	438 S	countries	447 S
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AGRICULTURAL ECONOMICS AND SOCIOLOGY

MONTHLY BULLETIN' OF AGRICULTURAL ECONOMICS AND SOCIOLOGY

LAND SYSTEM IN CHINA

SUMMARY. I Classification of rural population -- II Present land system: General characteristics - Types of ownership and tenancy - Leases and rents - Taxes and local government - III Economic and social consequences of existing conditions IV Legal redress and present outlook

I. — Classification of the rural population.

In the absence of any systematic survey or census by western methods in China estimates of the total population have varied to an extraordinary degree. Though official enumerations of "doors" (households) have been made for at least 200 years, no complete occupational census has ever been taken. There is no Indian cast system determining occupation. Evaluations of the agricultural population, mostly based on guesswork, have been made by the Post Office, the Ministry of Agriculture and Commerce of the former Peking Government, and the Bureau of Statistics of the Nanking Government. In comparing such figures the exact territory they refer to must be kept in mind. Some authors limit the use of the term "China Proper" to the eighteen provinces south of the Great Wall, to which official statistics still add the "Three Eastern Provinces" of the present Manchurian State, while three more provinces for Inner Mongolia, two for Nearer Tibet and the province of Sinkiang (Chinese Turkestan) may or may not be included in Greater China.

The latest estimate by a public authority, the Ministry of the Interior, gives a figure of 426.6 million inhabitants for China Proper (including Sinkiang, excluding Manchuria, Mongolia and Tibet), and of 466.8 million for Greater China (1936). The proportion of agricultural families has been put at 71, at 75 and even at 85 per cent. "The precise figure is less important, however, than the consensus of opinion that approximately three quarters of the population are engaged in agriculture". (Tawney).

Not only for figures but for categories used in classification consensus of opinion appears to be of more consequence than accurate distribution. For the purpose of analysis, Chinese farmers are commonly divided into (1) owner-operators, (2) part-tenants who lease others' land for cultivation in addition to their own, (3) tenants and (4) agricultural labourers. Classification of farmers in relation to ownership is indeed widely accepted as most indicative of their economic status, but this method is open to criticism.

For example, in Kwangtung, China's richest province, an analysis of 923 peasant families of the district of Pan-yu showed that as many as one in every six of the wealthy peasants possess no land at all, while a family classified as "owners" is sometimes obliged to send out its members as hired farm hands. Some owners may therefore be poorer than a tenant family which cultivates a large holding and hires many labourers.

As to classifying farmers according to the size of the area they cultivate, experience throughout the world has well proved that quite a different money income may be derived from the same area according to the climate, the quality of the soil, the nature of the predominant crops and the technique applied. On the other hand, an owner and a tenant family may cultivate the same number of acres, but their economic situation is obviously very different. Thus, neither the size of the area owned nor of the area under cultivation will furnish a really reliable basis for classification.

Nor does the establishment of a correlation between the economic status and the magnitude of the farm undertaking prove correct, as there are in the southern provinces, big landlords who manage small orchards and gardens (¹). The lack of cadastral books or land books in China makes it impossible to establish economic categories by western methods.

Classification on the basis of livelihood would seem to supply the most revealing categories. Up to the present armed conflict in the Far East only about 10 per cent. of China's population was said to be above the pauper standard. Peasant families which are just capable of self-support from the land they use and the labour power they represent, but do not have to hire workers or rely on wage income for subsistence are called "middle peasants" by Dr. Chen. Accordingly "rich" and "poor" peasants belong to the classes above or below that minimum, while hired labourers possessing no land at all are grouped together with the poor peasantry. However, such a minimum requirement for subsistence in terms of land and labour varies from one part of the country to another and would hence have to be calculated separately for every region, and as yet the necessary data are not available for large districts, let alone for the whole country. Professor Buck in his most comprehensive study of land utilisation in China provides quantitative and qualitative data on housing, food and clothing in 440 sample farms throughout 22 provinces. But no statistical distribution of the whole farming population in terms of prosperity is attempted in either of his studies, nor has it been established elsewhere.

Hence, for economic analysis of the land system we are compelled to rely on classification of the farming population in terms of ownership and tenancy. It must be kept in mind, however, that nearly every one of our western terms needs revising and clarifying if applied to the Far East, and second, that even within China comparisons should only be made between rural classes of the same agricultural region because of possible essential differences in conditions.

(¹) CHEN, H. S., pp. 5-8.

II. — Present land system.

General characteristics.

The present land system has a long history not to be dealt with here and has now been stabilised for many centuries. It is characterised by a slowly growing concentration of ownership combined with the use of land in tiny scattered holdings. ⁽¹⁾ The system of tenure has been the subject of intensive study by special commissions, but the estimates of the extent of tenancy are constantly varying.

Professor Buck considers it a fairly safe generalisation that owner-farms constitute a little over 50 per cent., part-owners' about 33, and tenants' 17 per cent. of all farms in China. But, as he observed in his first study on farm economy, such surveys are apt to include a somewhat greater proportion of larger and wealthier farms, as the more prosperous owners or tenants are more progressive and thus easier to approach for the Chinese student's investigation ⁽²⁾. A Chinese writer on land reform, Dr. C. K. Ping, criticises those figures for being too optimistic. He refers to the following estimates made by the Bureau of Statistics of Nanking in 1930, as being probably nearer the truth:

TABLE I. — *Percentage Distribution of Farm Tenancy* (3).
(Arithmetic mean)

Area	Owners	Part owners	Tenants
17 provinces south of Great Wall, excluding Kansu, plus Manchuria and Inner Mongolia	15	22	33

The following geographical distribution of tenancy has been calculated from figures published by the National Agricultural Research Bureau in 1934.

TABLE II. — *Geographical Distribution of Tenancy* (4).

Area	Percentage of operators who are		
	Owners	Part owners	Tenants
Inner Mongolia and Nearer Tibet (5 provinces)	57	20	23
Hoangho provinces (5 provinces)	94	21	15
Central China (4 provinces)	31	26	43
Southern China (8 provinces)	27	30	43
General average	43	25	32

⁽¹⁾ As to land utilisation in China, the farm studies of Nanking University directed by Prof. Buck computed the following figures: Within a total gross area of 1,400,000 square miles, in agricultural China, 340,000 square miles or approximately 25 per cent is cultivated. Of all land, 27 per cent. is utilised for crops, 4.6 per cent. for pasture, 8.7 for forest and 59.7 for other purposes or is valueless. Of the land in farms, 90 per cent. is used in crops, nearly 4 per cent. in roads, ponds, graves and the like, over 3 in farmsteads, over 1 in pasture, 1 in forest, over 0.5 in grass and bushes cut for fuel, and 0.3 in ponds. (*Land Utilization in China*, pp. 5-6).

⁽²⁾ *Ibid.*, p. 9; *Chinese Farm Economy*, pp. 39, 43, 145.

⁽³⁾ PING, p. 159.

⁽⁴⁾ WILMANN'S, p. 35.

The changes in the distribution of ownership calculated from the figures reported by 1,058 *hsien* in 22 provinces are given by the Bureau as follows:

TABLE III. — *Changes in the Percentage Distribution of Tenancy* ⁽¹⁾.
(Weighted averages).

Year	Owners	Part-owners	Tenants
1912	49	23	28
1933	46	25	29
1937	46	24	30

All estimates agree that the percentage of owner cultivators decreases from north to south. In the southern provinces great fertility caused by abundant rainfall, along with the early contact with western states and the rise of commerce, made for concentration of population and accumulation of mobile capital. Investment of money in land was for centuries regarded as the only safe and desirable form of investment. Moreover, in the south, topographic reasons encourage the splitting up of the properties of absentee landlords into leased holdings. Though the rain fills the large irrigation systems, water must be brought to the individual holding and often to every single plant by incessant hand-work.

" Besides fertilizing, transplanting and weeding the rice crop there is the enormous task of irrigation to be maintained... Each evening, if the night is likely to be cool, water is pumped over the bed to be withdrawn the next, so that the warmth might be absorbed by the black surface, and a fresh supply of air be drawn into the soil " ⁽²⁾

Had the same task to be accomplished by wage labour, the interest of the worker in such intensive culture would have to be stimulated by piece wages. But with the over-supply of human labour in China, a small tenant farm in which the whole family contributes its share will obviously be able to produce more cheaply than a plantation where the same return will only suffice for the wages of one adult male worker.

An analogous if slower spread of tenancy seems also to be proceeding from year to year in large parts of the country as is shown by Table III. We shall presently discuss more reasons for this concentration of ownership, but it must be remembered that the owner farms also are small and split up into tiny plots. Estimates of the average size of agricultural holdings in China can at best be no more than intelligent guesswork, but it is certain that the amount of cultivated land per head of population is steadily decreasing ⁽³⁾. In 1933, Professor Dragoni estimated the average size of farms throughout the country at about 2 hectares (or 30 *mow* of Peking standard) which would strike a medium between the Peking Government's estimate in 1922 of 24 *mow* (1.45 hectares) and that of the Nanking Ministry of Economic Affairs in 1934 of 36 *mow* (2.18 hectares). After his last survey of 16,786 farms in 22 provinces

⁽¹⁾ *Crop Reports*, June 15, 1938, p. 72.

⁽²⁾ KING, pp. 251, 262.

⁽³⁾ LIEU, D. K. and CHEN, C. M., cit. DRAGONI.

Professor Buck reached the conclusion that owner farms average 4.22 acres (1.71 hectares) and tenant farms 3.56 (1.44 hectares). A more accurate idea is given by the geographical distribution of average holdings:

TABLE IV. — *Average Size of Farm Holdings* ⁽¹⁾.
(Areas as in Table II)

Inner Mongolia and Nearer Tibet	3.87 hectares
Hoangho provinces	2.34 "
Central China	1.46 "
Southern China	1.03 "
General average	2.18 hectares

Chinese farms as measured by the farm area are the smallest in the world except for those of Japan.

As regards the distribution of the available farm land, comprehensive figures were collected by the Ministry of Industries in Nanking, in 1935:

TABLE V. — *Size Groups of Farms and Percentage of Farm Households cultivating them.*

12 northern provinces		14 southern provinces	
Under 10 <i>mow</i>	27.1	Under 5 <i>mow</i>	25.7
10-20 <i>mow</i>	21.5	5-10 <i>mow</i>	23.8
20-30 "	16.8	10-15 "	17.6
30-40 "	13.1	15-20 "	13.4
40-50 "	10.0	20-30 "	10.7
50-100 "	7.2	30-50 "	6.1
over 100 <i>mow</i>	4.3	over 50 <i>mow</i>	3.4
100.0		100.0	

No information is yet available as to the total area comprised in each of the groups, and thus it is impossible to calculate what proportion of land is cultivated in large farms. Ever since the abolition of latifundia by the Sung Dynasty in the 12th and 13th centuries, neither the direct exploitation of great estates by their owners nor large leaseholds obtain in China. And not only are holdings small but they are broken up into scattered plots as in Europe in the centuries before enclosure and in India up to the present day. A high proportion of land, as much as 8 per cent. in some of the most fertile districts ⁽²⁾, is occupied by tombs which are strewn all over the family land or massed in the centre of it and thus constitute another obstacle in the way of the convenient working of the plot.

Density of population is mostly held responsible for the fragmentation of the cultivable area, though what is striking in China is not so much general overpopulation as the congestion of human beings within a few fertile regions. Ex-

(1) WILMANN, p. 33.

(2) RAJCHMANN, p. 768.

cluding Manchuria, Inner Mongolia and Tibet, the mean density of the population is put at 56.2 per square kilometre, which is not high compared with 143 in Germany, 186 in Japan, 194 in the United Kingdom and 273 in Belgium. That six sevenths of China's population should be massed in one third of her territory seems perfectly believable if we consider the density of some of the richest and most progressive provinces: 149 per square kilometre in Kwangtung, 206 in Chekiang, 212 in Shantung, and 337 in Kiangsu. As Table IV shows, the largest holdings are to be found in the north-east where rain is scarce and land is still abundant, and the next largest are in the Hoangho provinces, whilst the smallest are in the south.

Another reason for the small size of holdings is the system of inheritance which in general prescribes equal partition of property among male heirs, the eldest son receiving a slightly larger share only in some regions. The son who inherits a plot of land from his father does not need to change the title deed of the land. New regulations for an inheritance tax were passed by the Central Political Council of the Kuomintang in December 1936, but their enforcement was put off indefinitely by the national crisis.

Bad means of communication made and still make internal migration difficult. This is best illustrated by the fact that five provinces, including Szechwan, agriculturally China's "celestial province", have no railways at all. The cost of transporting surplus products from the interior to marketing centres is almost prohibitive. Consequently once adjusted to the available transport possibilities and the existing agricultural technique, the size of the holding tends to remain unchanged ⁽¹⁾.

Types of ownership and tenancy.

"Of the economic and social factors perhaps the system of tenancy is the most disquieting" the technical delegate of the League of Nations stated in his report in 1934, and the studies made by special commissions of the National Government, by the Chinese Land Economic Association and by the technical staff of the National Economic Council came to the same conclusion ⁽²⁾. Yet the extent of farm tenancy in China is not alarmingly high, and if it is admittedly much higher than in Denmark and Canada, it is no more so than in Germany and Japan, not to speak of Great Britain.

TABLE VI. — *Percentage distribution of tenancy in different countries* ().

Country	Owners	Part owners	Tenants
Belgium (1930)	68.0	—	32.0
Canada (1930)	88.6	3.4	8.0
Denmark (1930)	99.4	—	5.6
Germany (1930)	17.6	29.9	42.5
Great Britain (1930)	11.7	3.8	84.5
Japan (1934)	31.0	42.0	27.0

⁽¹⁾ T'ANG, C. Y., p. 248.

⁽²⁾ RAJCHMANN, p. 767; cf. DRAGONI, p. 15.

⁽³⁾ PING, p. 161; BUCK, *Farm Ownership etc.*, p. 3; *The Japan Manchukuo Yearbook*.

Professor Buck insists that the problems of tenancy are sometimes over-estimated in their magnitude, and that they are of great importance only in certain Chinese regions. What then, apart from general economic distress, are the grievances of tenancy which Chinese writers claim to be peculiar to their country? What are the economic and political powers of landowners, if China possesses no manorial estates, if landlord and tenant are not on the whole members of different classes or different peoples?

Theoretically the State is considered the ultimate owner of all land, but practically the private owner may do what he pleases, so long as he pays his taxes and does not permanently impair the value and resources of his holding. All waste land is supposed to belong to the State, but ownership can be claimed after application. Generally, landownership is constituted by a title deed issued and stamped by the local magistrate's office. Since the establishment of the republic an additional certificate of the local Land Registration Office is required. In actual practice, however, especially in remote districts, land transactions are very often considered valid when sanctioned by the village elder, without any change of the title deed or new registration. Plots are handed down from generation to generation without any change of the title deed⁽¹⁾.

To study the existing types of landlords we recur to percentage estimates of privately and publicly owned land. Private land means land owned by not more than one family, for in China the overwhelming majority of land is still the private property of a family, not of an individual. (This probably explains why owners may register land under different names, which constitutes another hindrance to the collection of satisfactory statistics). By public owner is meant any larger corporate body.

Of publicly owned land, eight categories were known under the Empire, four of which have been nearly entirely transformed to private ownership during the course of the 19th century:

- (1) crown lands in the vicinity of Peking;
- (2) banner lands bestowed by the Emperor on members of the army and the Manchurian aristocracy;
- (3) tribal lands of aboriginal chieftains recognized by the government, in the west and north-west;
- (4) government lands, belonging mostly to the provincial or district government or to public charity organisations. Some of the government land is still in existence along with the following farms of public land:
- (5) temple lands and land belonging to Buddhist monasteries and convents;
- (6) education lands, intended "to defray the expenses of worshipping Confucius" especially in the Sage's birth-province Shantung, of subsidising poor scholars, and more recently of maintaining government schools;
- (7) military colonization lands for soldiers' settlements in border regions;

(1) I,AMB, p. 18.

(8) ancestral or clan lands owned by the component families of a clan and set aside for ancestral worship which is performed twice a year in the clan temple (¹).

Traditionally, clan land was indivisible and could not be disposed of, the title deed being carved on stone tablets and let into the walls of the ancestral temple. But during and after the Nationalist Revolution of 1926-1927, a strong revolt against every sort of entail or mortmain became manifested. Much clan land was sold secretly or even openly, and monks and nuns were driven from their abodes and their land expropriated. Even before, most public land and specially clan land had come nearly entirely under the control of its managers and treasurers who treated it as their own.

Percentage estimates of public land vary according as to whether or no they include ancestral land. Professor Buck's survey (²) shows only 17 per cent. of the total cultivated area to be public land, of which government land constitutes 1 per cent., military land over 2 per cent., temple land less than 2 per cent. and ancestral land, charity land, education land and all other public land less than 1 per cent. each. The latest available official figure for a greater part of the country must be taken from a survey of 1919 carried out by the Ministry of Agriculture and Commerce in thirteen provinces: two provinces of Manchuria, two of Mongolia, five of the Hoangho provinces, four of the south. The general average shows 66 per cent. for privately owned land, but the second column of 34 per cent. comprises both purely public and "mixedly public and private land" which obviously refers to clan land (³). Only one fourth or 8.5 per cent. of the "mixedly" owned land is said to be publicly owned. This figure, if compared with the above mentioned 7 per cent., seems quite credible.

Even though clan land has diminished and is rapidly becoming private property, such property too is subject to traditional restrictions. Thus family land may not be sold without the consent of the more important members of the clan, or of the adjacent neighbours who enjoy a prior right of purchase. All these restrictions are no longer upheld by law, but *de facto* in the south clans and families form blocks of collective owners against whom the tenant cannot hold his own. In Kwangtung, Dr. Chen maintains 35 per cent. of the cultivated area belongs to clan land and other kinds of public land, and the annual rent from clan land in that province, in which the percentage of tenancy is among the highest in China, amounts to 126,000,000 Chinese dollars (⁴).

With the almost continuous civil wars a new type of absentee landlord has sprung up, especially in the Yangtze provinces and in the south. Many modern war lords have invested their incomes from requisitions and taxes and all sorts of embezzlement in large tracts of land, and then collect their rents by military force.

(¹) *Agrarian China*, pp. 1-5, 21-26.

(²) 111 *hsien* (districts) in 20 provinces, 1929-1933. (*Land Utilization in China*, p. 194).

(³) LAMB, pp. 42-47.

(⁴) CHEN, H. S., Introduction to *Landlord and Peasant*, 1936. In Professor Buck's survey a percentage of 0.0 is given for ancestral land, temple land and government land in the double cropping rice region to which Kwangtung belongs, but then obviously such land is classed among private land. (*Land Utilization in China*, p. 194).

Apart from military occupation and, in more peaceful districts, from inheritance and donation, there are special reasons in China which make for land ownership without the actual management of the holding. Owing to political and economic instability and the lack of a national stock exchange, security marketing has not yet spread very far into the interior. The owners of small savings are still reluctant to invest them in local industry or in any enterprise not personally known to them, apart from the big banks and the State loans. Remittances from emigrants overseas mostly find their way into land purchase. Moreover, in all provinces an extraordinary social prestige is attached to landed property. And rich peasants generally deem it safer to collect rents on part of their property than to subject the whole of it to the risks of excessive taxation and military requisitions.

What are the factors which induce peasants to become tenants? All observers agree that most farmers in China become tenants because in the absence of adequate credit facilities they do not command enough capital to purchase a farm and at the same time provide for sufficient operating capital. Some farmers are tenants because they prefer using their capital for operating expenses on a bigger holding, rather than investing it in the purchase of a smaller one. For a beginner, tenancy, especially share-tenancy, may be an advantage, because he shares the risks with the landlord and also secures some expert supervision (¹). And more and more owners become so impoverished by debts and mortgages, taxes and requisitions, that they are forced to give up their property. As the national industries are not sufficiently developed to absorb them, nor is there any plantation farming on which they could find work, such owners become tenants on their former property.

In recent years, especially after the passing of the Land Act in 1930, two new systems of ownership and tenancy have been developed. Government waste land was reclaimed and eventually became the property of the claimants. Also pasture land owned by Mongols was reclaimed by Chinese soldiers with the right of perpetual tenancy, the soldier tenants delivering a share of their crops to the nomad owners. Both methods have been adopted for civilian immigrants and for soldier settlers in the north-west and along the Mongolian border, but the present national crisis broke out before the results of these measures could appear.

Remnants of hereditary tenure are found throughout the southern and central provinces. A special form of permanent tenancy is found in the coastal provinces of Kiangsu, Chekiang and Fukien, and also in Anhwei and Kiangsi: it consists in joint ownership of land by the landlord and his permanent tenant. The landlord owns what is called the "bottom rights" or "bone rights", meaning the land for which tax must be paid, and the tenant owns the "surface rights" or "skin rights", meaning the right of cultivation which he may sell or mortgage or sublet separately.

Leases and rents.

As ever in the absence of legal regulation, the forms of land leases vary throughout China and even within the same province and district. Leases fall into two main groups, share-tenancy and cash-tenancy. Share-rent means the payment after the harvest of a fixed proportion of one or more crops, according to the half-and-half, the two-fifths, the three-fifths, or the cropper system. In the latter form the landlord furnishes land, buildings, implements, seed and fertilizer—animal husbandry is too little developed—in short, everything except the labour which is supplied by the tenant and his family; the landlord receives a correspondingly large share of the products.

Cash-tenancy means the annual payment of a stipulated rent, reckoned either in money (cash-system proper), or in produce (crop system), or in produce converted into its money equivalent (cash-crop system).

Professor Buck found that as a general rule tenants prefer share-rent, because the landlord shares the risks involved. It prevails in the north where scarcity of rain and the menace of floods make farming more precarious. The half-and-half system is probably the most common in the north. The amount given to the landlord "depends upon the crops requiring different amounts of labour and capital, upon the varying degrees of productivity of the land, and upon the dissimilar amounts of capital supplied by the landlord. However,... adjustment is not often wholly successful because in many cases the systems were adopted hundreds of years ago and have not been altered to meet changing conditions" (1).

The tenant obviously has many ways of cheating the landlord, such as giving him inferior crops, or hiding some of the threshed grain before division takes place, or sub-letting the land to bad tenants without the knowledge of the landlord, or, as in cash-tenancy, year after year reporting crops worse than they are to obtain a reduced rent.

In the south, with its important class of urban landowners, cash tenancy is more common as it is better adapted to the modern trend towards commercialism and the new inducements to buy all sorts of cheap consumption articles. It is more convenient to absentee landlords, while to the tenant the safer and more intensive southern agriculture offers some chance of profit. Resident landlords, on the other hand, prefer the crop system, because they have storage space for grain and can afford to wait for higher prices.

It is impossible to say which of these systems is economically the better, because the varieties of each are more or less adapted to the different economic and physical factors. Still, it would seem that share-tenants were less interested in progress because the landlord receives such a large share of the return to any additional effort. The Land Act of 1930 therefore specially provided for compensation of the tenant if crop increases are due to improvements he has made.

Rent contracts are fixed by verbal agreement, mostly for one year, and are then tacitly renewed. The majority of tenants operate the same holding for

(1) BUCK, *Farm Ownership* etc., p. 11.

their whole life, but there are many regions where tenants change frequently, as in the vicinity of big ports and cities. Hereditary tenure is found in the south, but it is slowly going out of use. On the whole, the terms of tenures are tending to become shorter, but always with the possibility of easy renewal. In the south, where the evils of sub-letting form a special grievance, it is a common practice for the first or original tenant to lease land from the clans for 20 or 30 years, sub-leasing it for periods of 1 to 5 years. Almost every renewal of the sub-leases is accompanied by an increase of the rent, till the final tenant, *i. e.* the cultivator himself, often pays twice the amount the original landlord receives.

Rents are generally collected after the harvest, but payment for one or even more years in advance is quite common. Rents are either paid directly or collected by a third party, a compradore. Special evils are attached to the latter so-called "*chang fang*" system which has sprung up with absenteeism in the second half of last century. The compradore may easily force the tenant to bribe him, or he may "squeeze" (embezzle) the money paid by an honest tenant and then tell the owner the tenant is incapable of paying.

The practice of so-called rent deposits has greatly increased in recent years. It is prevalent in more than 60 per cent of the *hsien* (districts) according to a government investigation in 1933. From a form of security for a leasehold it has developed into a new means of usury and blackmail. The tenant is asked to pay more and more sums additional to the original rent deposit or he is threatened with eviction, often without the deposit being returned to him, even though he has always duly paid his rent. Owing to the sharp competition among peasants and the scarcity of land in certain regions, a new tenant can generally be found willing to pay the additional fees.⁽¹⁾

As to the actual height of rents, the complications of the various systems are so great that it is hard to strike an average in terms of shares or of money. In some regions, for instance, the share is calculated out of basic crops only, in other from both the main and by-products of the farm. Rent figures, to be exact, should include rent deposits not recovered by the tenant, compulsory presents made to the landlord, and transport costs of the produce to the landlord's farm or agency. A Chinese economist, Professor Franklin Ho, on a study made in Chekiang in 1928, estimated that the farmer paid 45 per cent. of his produce to the landlord.⁽²⁾ Professor Buck found payments varying from 25 per cent. in Kiangsu to 67 per cent. in Shansi. The landlord's return on his capital investment averaged 8.4 per cent. or, according to a Chinese agricultural economist 11 per cent.⁽³⁾ Compared with interest rates on loans of 40 and 50 per cent., these figures certainly seem low. But, as Professor Buck points out, investment in land is the safest form of investment in China, and if a fair rent should result from division of total farm receipts between landlord and tenant in the same proportion as expenses are borne by the two parties, the landlord gets too much.

⁽¹⁾ *Agrarian China*, p. 94.

⁽²⁾ RAJCHMANN, p. 18.

⁽³⁾ CHANG, C. C., cit. TAWNEY, p. 67.

It was on a very similar basis that the Land Act of 1930 fixed the maximum rent at 37.5 per cent. of the total produce, but, as with the reforms of land tax provided by the act, it could not be effectively enforced.

Land taxes and local government.

Though in law fiscal charges are met by the landowner, in fact the land tax appears often to be paid in whole or in part by the tenant. The rural class is China's most important tax-payer and the tax burden is a heavy one per acre (U. S. A. \$ 1.79 in 1929-1932, compared with U. S. A. \$ 0.46 for all land in farms in the United States in 1932) ⁽¹⁾ M. Lachin estimates the total amount of land tax paid at 400 million Chinese dollars, probably on the authority of Professor Franklin Ho. The burden it imposes is best illustrated by a comparison between recent changes in land values and land taxes in China (22 provinces)

TABLE VII. -- *Changes in Land Values in China, 1935* ⁽²⁾.
(1931 = 100)

	1912	1931	1932	1933	1934	1935
Paddy land	74	100	95	89	82	81
High land	73	100	93	87	83	83
Hilly land	72	100	94	88	82	82

TABLE VIII. -- *Changes in Land Taxes, 1935* ⁽³⁾.
(Land taxes of 1931 = 100).

	1912	1931	1932	1933	1934	1935
Paddy land	59	100	107	108	108	101
High land	62	100	109	111	111	103
Hilly land	61	100	108	111	111	104

TABLE IX. -- *Land Taxes as a Percentage of Land Values* ⁽³⁾.
(Land value for each year = 100)

	1912	1931	1932	1933	1934	1935
Paddy land	1 69	2 08	2 39	2 57	3 05	3 09
High land	1 80	2 33	2 48	2 74	3 26	3 49
Hilly land	1 99	2 48	2 74	3 05	3 40	3 74

A careful study of the land tax problem was made in 1932-1934 by Professor Dragoni for the National Economic Council. His report came to the conclusion that the old land tax, if levied in conformity with the law, would by itself represent no undue burden. The features of land taxation which make it a central factor

(1) BUCK, *Land Utilization in China*, p. 16

(2) From *Crop Reports* August 15 1936

(3) The figures were calculated from the actual amount of land taxes paid by the farmers, including both the basic tax and the surcharges, with the modal value per *mow* as 100. *Crop Reports*, August 15, 1936.

of agricultural distress are the surcharges, the grossly disproportionate incidence in different districts, and the system of tax collection with the waste and extortions it involves.

The land tax is the main source of provincial revenue, but the *hsien*, far more than the province, is the basic unit of local government in China. ⁽¹⁾

To each *hsien* is appointed a district magistrate who collects the State revenues out of which he has to remit a fixed sum to the provincial government, and keeps the remainder for himself. In many cases neither he himself nor the members of his staff receive a fixed salary. With the establishment of the Republic the *hsien* government began to be "bombarded with a multitude of orders" (C. M. Chang), especially for the foundation of a school and police system. No special revenue being available for its growing functions, the *hsien* was forced to add surtaxes to the existing State taxes and has lived on surtaxes ever since. The most important ones are the surcharges on the land tax, such as the public safety surcharge, the self-government surcharge, the census-taking surcharge, the *ch'u* office surcharge, the *hsien* education surcharge, the *ch'u* education surcharge, the water conservancy surcharge, the reconstruction surcharge, the relief surcharge, the peace preservation corps surcharge, etc. Taken by provinces, there are 147 different surtaxes on land taxes in Kiangsu, after Kwangtung the richest province, 73, 61, 61, 25, 25, 23, 20, 17, 14, in the southern provinces of Chekiang, Hupeh, Kiangsi, Anhwei, Kwangtung, Hunan, Szechwan, Yunnan, Fukien respectively, and 48, 42, 30, 9 in the Hoangho provinces of Hopei, Honan, Shansi, Shensi. The Rural Rehabilitation Commission set up in 1933 found that the surcharges everywhere exceed the amount of the basic tax, and that in some places the surtax amounted to 25 times the regular land tax.

On the other hand, in five relatively rich *hsien* of Chekiang — an exceedingly fertile province which enjoyed peace from 1926 to 1937 — the surcharges were found to involve an excess over the land tax of only 25 per cent. on the average. Yet in five relatively poor *hsien* of the same province the average excess involved was 350 per cent. ⁽²⁾

How exactly the land tax which is based on an assessment made 200 years ago is allocated and collected, has never been officially exposed or controlled. In the south we are told of special agents, tax collecting merchants, who, once the Government has accepted their bid, monopolise the collection and sometimes pocket as much as ten times what the Government receives. The clan treasurers who control all the income of the clan also collect the land tax on clan land, then pass on to collect the tax on the private possessions of the clan families, and eventually become the tax collectors for the whole village.

It should be mentioned here that military requisitions taken in labour, kind and money have become another heavy surtax burdening the peasant. Owing to the almost continuous civil wars military requisitions were to be found in all

⁽¹⁾ The 28 provinces are divided into 1,943 *hsien* or districts; every district is composed of a number of *ch'u* or countries.

⁽²⁾ RAJCHMANN, p. 768, quoted from Professor DRAGONI.

28 provinces, even before the present Sino-Japanese conflict. These requisitions too are assessed on the land tax, and ordered by military head-quarters, but the *hsien* government is charged with their collection. This is not possible without the help of bureaucrats and merchants, and most of the powerful officials and merchants happen also to be landlords who make their tenants pay for them by increasing their rent.

In May 1934 the second National Financial Conference met for the express purpose of the reform of the provincial and district government. The abolition of the multifarious surcharges was decided on, and the collection of taxes on a commission basis was to cease. Up to the outbreak of the Sino-Japanese armed conflict the reforms are said to have been carried into effect to a certain extent. During the second half of 1934, in all 3,600 miscellaneous surcharges were suppressed in 22 provinces amounting to a total sum of 28,890,000 Chinese dollars, and from January 1, 1935 to August 31, 1935 another 1,600 surcharges were abolished (20,140,000 Chinese dollars). ⁽¹⁾

But if no new source of income is provided for the *hsien*, how is it to maintain itself and to carry out its functions, particularly those of agricultural reconstruction? True, as from July 1934 the entire revenue from the tobacco and wine licence tax was allotted to the various local authorities and 30 per cent. of the proceeds of the stamp tax to the *hsien* to make up for the deficit resulting from the reduction of land surtaxes. But the new distribution does not seem to have worked well, and the *hsien* still has no share in the basic tax revenues.

Besides, without some sort of land survey no cadastral reform can be carried out. In China land has never been properly surveyed, and village elders keep primitive drawings of the distribution of parcels which convey no exact idea of their real size. "The cost of making a survey by the usual methods is prohibitive; a moderate estimate puts it at 150,000,000 Chinese dollars for the whole of China... By using aircraft the cost might be drastically reduced". ⁽²⁾

A Commission on Land Research and Planning was organised in 1934. It started an investigation which covered 1,047 *hsien* in 22 provinces and a summary of the results was due to be submitted to the central authorities in 1937 when hostilities broke out.

III. — Economic and social consequences of existing conditions.

Political instability, the backwardness of agricultural technique, the lack of transport and of credit facilities and the slow development of co-operative societies all combine to render China's agriculture less productive than would be expected from the intensive methods of cultivation employed. True, considering the output per unit of area, productivity seems quite satisfactory. Wheat yields are lower than in Japan, Egypt and, of course, in most European countries, but higher than in Canada, the U. S. A., the U. S. S. R. and India; whilst China's

⁽¹⁾ CHANG, C. M., p. 34.

⁽²⁾ RAJCHMANN, p. 773.

rice yields come fourth after those of Italy, Japan and Egypt (see Table X). Yet, in relation to the density of population and the intensive application of human labour, the output cannot be called a high one. According to Professor Buck's calculations ⁽¹⁾, China produces only 1,400 kilogrammes of grain per man-equivalent (one farmer working a full year) as compared with 20,000 kilogrammes in the United States.

TABLE X. — *Crop Averages, 1928-29 till 1937-38 (a).*
(Quintals of 100 kilogrammes per hectare).

	Wheat	Rice
Canada	8.8	—
China	11.0	(b) 25.9
Denmark	29.3	—
Egypt	19.7	31.5
France	15.1	—
Germany	21.6	—
Hungary	13.7	—
India	7.2	14.2
Italy	14.0	49.5
Japan	18.4	35.9
Poland	11.8	—
U. S. A	8.3	23.0
U. S. S. R	7.7	—

(a) International Yearbook of Agricultural Statistics, 1938-39.

(b) Nine years' average from 1928-29 to 1936-37.

Is a reform of the present system of land tenure likely to increase crop production?

Generally speaking, a new regulation of the tenancy system cannot be expected to increase the yields directly, but to improve the economic conditions of the peasant class. On the whole, tenants were found to be better farmers than owners. According to Professor Buck's calculations, the operator's labour earnings ⁽²⁾ are much higher for tenants than for owners. "Apparently, from the business standpoint where interest is charged on investment there is some advantage in being a tenant, but the real advantage is the owner's in that he saves a yearly rent payment, which is about equivalent to interest on capital investment in land and buildings, costs of taxes, and up-keep of the farm, plus the landlord's profit". Besides, the family earnings ⁽³⁾ are "decidedly greater for the owner than for the part-owner or tenant" ⁽⁴⁾.

⁽¹⁾ *Land Utilization in China*, p. 15.

⁽²⁾ The operator's labour earnings represent the farm operator's returns for one year's labour, after deducting farm expenses and the interest on his capital investment. The unpaid labour of the farm family is charged as an expense, and the produce from the farm used by the family is included as a receipt.

⁽³⁾ The family farm earnings are the operator's farm receipts, plus income from subsidiary sources, plus the rent value of the residence, minus the operator's farm expenses except the value of the family labour.

⁽⁴⁾ BUCK, *Chinese Farm Economy*, pp. 19-20, 153-154.

It is said that a reform of land tenure might increase crop yields, because the small size of holdings is closely related to the problem of tenancy as owners let out their land in small strips, and because agricultural mechanisation cannot be applied to congested areas broken up into small lots. But even if applied on larger owner-cultivated peasant farms such machines increase the yield per man rather than per acre, and are unsuitable for a country in which labour is so much cheaper than land or credit. The problem of farm mechanisation in China cannot be fully debated here, but clearly unless industries developed to absorb the surplus rural population that would result, the replacement of men by machines would mean the starvation of millions⁽¹⁾.

At its present stage, tenancy is certainly one of the chief sources of discontent among the peasant class. With the lack of control from the central and provincial government, the landlord, in overpopulated regions, may possess unusual power in local administration with few liabilities to meet. Much more than the owner the tenant is at the mercy of the magistrate, the moneylender and the tax collector. He is helpless before collective landlords, before railroad and steamship companies, militarists and bandits; he is mostly illiterate and cannot write a petition, nor would he know where to send it.

As to the attitude of the rural classes towards one another, any observer will have difficulty in finding a formula to cover the extraordinary variety of social and economic conditions. As a general rule, however, it may be stated that the tenant does not yet enjoy effective legal protection, but that his interests are safeguarded by usage and by his personal relations with the landlord. Under normal conditions this may be a more effective safeguard than a westerner would imagine, and will be preferred by the peasants to legislation which the State lacks the necessary administrative and financial machinery to enforce. In Kiangsu, for instance, until 1930 feudal practices existed unknown to the rest of China, and tenure was held at the will of the landlord so that the tenant could be evicted at any time without compensation; yet such eviction was nearly unheard of. If, then, economic pressure bears too hard on the owner himself, or if there are no personal relations possible because of absenteeism or because a corporate body owns the land, class distinctions and ill feelings become more pronounced and legal action seems the only remedy.

Farmers live in the closest dependence upon each other all over China. The practice of borrowing and lending implements and animals is quite common, just as is joint ownership of one water-buffalo by two or more farmers. In better days systems of mutual credit prevailed among the peasants in order to avoid resort to the local usurer. The development of rural co-operatives is still in a rudimentary stage⁽²⁾.

(1) For fuller information cf. SALTER, p. 11; TAWNEY, p. 53, 105, *Crop Reports*, 15.8.1936, p. 205. For a cost computation for tractor ploughing with co-operatively owned tractors see BUCK, *Chinese Farm Economy*, p. 314-315.

(2) Cf. LENZ, A., "Co-operation in China," in the July 1938, issue of this *Bulletin*.

IV. -- Legal remedies and present outlook.

In spite of all its evils, no reformer has advocated the total abolition of tenancy, for too many social and topographic factors point to that form of landholding as the natural solution for large agricultural regions in China. The problem is rather one of eliminating the evils of the existing system, every one of which has been fully dealt with in the Land Act of June 30, 1930. It was the outcome of eighteen years of agrarian movement and agrarian legislation after the foundation of the Chinese Republic.

Dr Sun Yat-Sen soon realized the fundamental importance of the land problem, but his efforts were primarily directed towards the establishment of a constitutional republic and a national modern industry on western lines. The Communist Party first became interested in the farmer as revolutionary material, and during the period of its strongest influence (1920-1927) greatly encouraged the Farmers' Movement. After a period of violence in 1925-1927 the Movement lost much of its influence, but it had brought about the "psychological change" fundamental according to Dr Sun's teachings the peasants had begun to realize the possibilities of improving their lot and the new government the necessity of reforms. With the establishment of the National Government in 1927 the series of reforms the Kuomintang had started in 1924 was continued on an ever expanding scale, till agrarian legislation found its first complete codification in the Land Act of 1930. A revision of the Land Law was passed by the Central Political Council on May 5, 1937.

The 1930 Land Law stipulates that a maximum area for landownership may be fixed by the provincial authorities according to the quality of the soil. Any owner with possessions in excess of this limit may be expropriated with or without compensation (articles 14, 335, 372). Another revolutionary provision is that, where a tenant has worked his leased land for ten years, and his landlord is an absentee, and neither old, nor weak, nor an orphan or a widow, the tenant may apply for requisition of this holding (articles 125 and 329). Rent for farm land is not permitted to exceed 37.5 per cent. of the total income derived from the land (article 177), that is to say the maximum rental rate was to be 50 per cent. of the main harvest, with a reduction of 25 per cent. for the auxiliary crops. The tenant cannot be evicted unless he fails to pay his rent for more than two years, or the landlord himself wishes to cultivate the holding (articles 172 and 180). If the landlord wishes to sell, the farmer is to have a prior right of purchase (article 173). Upon termination of a contract of tenancy, the tenant is to be compensated for improvements which he has made. Increases in crops due to these improvements are not to be counted in the calculations of the landlord's share (articles 176 and 186). The lessee has no right to sublet the land to a third party (article 147). One of the most important provisions is for re-arrangement of strips into compact holdings. Such enclosure can be compulsorily carried out by the provincial authorities, provided that more than half of the farmers do not object (articles 18-20 and 211-216). Land tax must be paid by the owner (article 178). Ten chapters are devoted to the reform of the land tax and to a new system of periodical assessment. Apart from

expropriation of absentee landlords, the number of owner operators is to be increased by the reclamation and utilisation of waste land (articles 188-210). The amount of land granted must be sufficient to yield enough food for a family of ten, including children (article 193).

In reality, neither the State nor the tenant peasants possess the necessary means to utilise expropriated land. Landowners during recent years have been forced to go on paying land tax for their former lands that passed into the hands of the government but have remained uncultivated ever since. Excepting the regions of colonization on the northern and north-western border, the policy of breaking up large estates has narrow possibilities in China. As we have seen, large plantation farms do not obtain in that country and the majority of estates are already intensively used in small holdings let out to peasants. On the other hand, the increase in the amount of farm land to be expected from the removal of graves from arable land, from enclosure, and from land reclamation would, according to Professor Buck's calculations, only amount to 23,000,000 acres, (9,308,000 hectares) i. e. an additional 10 per cent. of the present area in farms ⁽¹⁾.

In 1937 the Central Political Council decided that the Revised Land Law should no longer impose a limit on the amount of land to be owned, but fix a minimum area for each owner-cultivator family. The requisition of leased land by its tenant should take place after 5 years instead of 10.

As to alleviating the tenant's position, the 1930 Land Act may now be regarded as having failed utterly to enforce its programme of rent reduction. Professor Dragoni studied the problem in 1933-34 in Chekiang, the only province where the 37.5 per cent reduction had been put into practice ever since it had first been introduced by a government decree in 1927. He was told that "the legal machinery to settle disputes and enforce the law is inadequate, that the landlord, exacerbated by the law, has other ways of compensating himself at the expense of the tenant; and that the benefit of rent reduction is exploited by the Peasants' Union (which, formed originally to enforce rent reduction, has too often become a new instrument of exaction)" ⁽²⁾. Most disputes arose from the administration of rent collecting, as rent collectors could deliberately avoid seeing the crops and then accuse tenants of not declaring the harvests correctly. In the districts where permanent tenancy obtains more difficulties were caused by the great disparity between the rent of ordinarily leased land and the price of "surface rights". With the new reduction the rent paid by the permanent tenant would be much lower than ordinary rent, and the landlords threatened their permanent tenants with eviction by force or accused them of being Communists, if they insisted on the standard rent being applied.

The 1937 Revised Law stipulated a different basis for a standard rent, to be fixed at 8 per cent of the value of the land, but paid in money or produce according to local traditions. But the new law is not likely to bring about any

⁽¹⁾ *Land Utilisation in China*, p. 202.

⁽²⁾ RAJCHMANN, p. 767.

more rent reduction than the old one, if the land value is to be fixed by the land owner, and provincial and local administrative powers continue to be vested in the very landowners whose interests would be affected by the carrying-out of that law.

The 1930 Land Act could not be enforced in the Yangtze provinces (Hupeh, Hunan, Honan, Anhwei and Kiangsi), which from 1930 to 1932 were the scene of guerilla warfare between Government and Communist troops. After Marshal Chiang Kai-Shek's victory in 1932 those provinces came under the special jurisdiction of General Headquarters. The old landowners had been murdered or evicted, title deeds destroyed, land marks removed and the land redistributed by the Communists. When many of the former owners returned in the wake of the government troops immediate measures were called for. Special agrarian decrees for the Yangtze provinces were promulgated in October 1932, mainly dealing with the restoration of their property to former owners and with the distribution of unclaimed territories to landless farmers: a moderate land reform. Marshal Chiang gave a summary of his land policy in the following message to the Executive Yuan, dispatched on the eve of the 4th plenary session of the Central Executive Committee, the highest constitutional organ (January 17, 1934):

"...There is no lack of arable land in this country which is more than sufficient for distribution among the population.... Even in densely populated provinces, there are few landowners holding more than several hundred or several thousand *mow* of land, the majority being small landowners owning about 30 or 40 *mow*. The question of exploitation and readjustment is therefore, in my opinion, more urgent than that of redistribution.

...Exploitation and readjustment of the land should be carried out through co-operation and collective cultivation,... The redistribution of land should thus be achieved by peaceful means, so that all tillers of the soil may gradually be given their share of the land... Private ownership of land is recognised and protected. It is, however, subject to two restrictions namely, (1) that landowners must give all persons in the village capable of tilling the soil an opportunity to work on their farms; and (2) that the maximum land holdings are to be limited; those holding land of an area in excess of the maximum limit are to be subject to graduated taxes. Revenue derived from these taxes is to be employed for financing agricultural enterprises". Landowners, owner-farmers and peasants are encouraged to form co-operative societies, which will be given the priority in acquiring land whenever a piece of land is offered for sale in the village. "Those who are not capable of tilling the soil will not be made members ... The farms acquired by the co-operative society will be distributed to members for cultivation, with ownership, however, remaining in the society. For this privilege, members are required to pay to the co-operative society a farm rent which will be used for the improvement of methods of cultivation".

The development of the present conflict has temporarily relegated the land policy to the background. Long ago the Kuomintang Party came to the conclusion that agrarian reforms in China should go hand in hand with the industrial

development of the country, which would create both employment for surplus rural population and outlets for agricultural products. The future will have to decide whether the growth of a national industry is to continue or whether foreign manufacturing countries will furnish the Chinese market. Yet the future success of any great manufacturing industry in or for the Far East will depend on the development of the great market that China may become. And China's purchasing power depends essentially on the purchasing power of her rural population.

L. LICHNOWSKY.

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THE INTERNATIONAL REGULATION OF THE TEA MARKET SINCE 1936 ⁽¹⁾

In an article published in 1937 we examined the international agreement of 1933 relating to the restriction of exports and the production of tea, and earlier attempts to organise the international tea market. In the same article the position of the tea market during the first three years' operation of the agreement was also considered.

We shall deal here with changes in the tea marketing regulations since then, beginning with an examination of the position of this market during the last two years that the 1933 agreement has been in operation—1936-37 and 1937-38.

In 1936-37 there was a marked improvement on the tea market. While total exports from the producing countries amounted to 833,500,000 pounds, against 846,000,000 pounds exported in 1935-36, the total absorption rose to 890,800,000 pounds, against 874,100,000 pounds in 1935-36.

The countries bound by the agreement were responsible for the reduction in exports; the non-signatory countries increased their exports by 7,800,000 pounds, whereas the signatory countries exported 20,300,000 pounds less in 1935-36, owing to the smaller unused balances of export quotas carried over from the preceding year, the reduction of exports from India by land, and finally, the reduction in 1936-37 of the Indian quota with a view to correcting the excessive exports by land which had taken place before September 1, 1935.

The increase in absorption of 16,700,000 pounds over the figure for the previous year would have amounted to 34,000,000 pounds if there had not been a reduction of 17,200,000 pounds in the absorption of the U. S. S. R. This the Committee considered more apparent than real, as being due to changes in the method of publishing the figures.

There is of course no way of knowing to what extent the increased absorption was due to expanding consumption or to an increase in invisible stocks.

This disparity between exports and absorption led to reduced stocks in customs warehouses, in the consuming countries and afloat. At the end of March 1937 stocks in customs warehouses in the United Kingdom were lower by 76,100,000 pounds than at the end of March 1936. In the Netherlands, France, Ireland and Canada, which also publish monthly figures, stocks showed a total fall of 2,100,000 pounds. In Germany there was an increase of about 3,000,000 pounds. Thus in the year 1936-37 there was a total fall in stocks of about 73,000,000 pounds.

It appears that the fall in stocks was due, apart from the increased absorption in several countries, to the fact that there was an exceptional drain on customs warehouses because of a fear that the tea duty in England would be increased.

⁽¹⁾ In writing this article we have drawn largely from the reports of the International Tea Committee.

TABLE I. — *Output of Tea, 1933-1938.* (1)

(Million pounds)

Countries	1933	1934	1935	1936	1937	1938
Ceylon (2)	210.1	218.7	212.2	218.1	213.1	235.7
Taiwan	20.6	24.3	23.6	24.0	28.6	—
India	383.7	399.3	394.4	395.2	430.3	456.4
Indo-China	13.2	14.1	19.8	19.8	20.2	—
Japan	95.9	97.5	100.6	105.7	118.9	120.6
Netherlands Indies	166.0	157.2	157.4	166.6	164.3	178.4
China (2)	90.3	103.7	84.1	82.2	89.6	91.8

(1) Only countries where the average output in the last 6 years has been not less than 10 million pounds have been given.

(2) The statistics for output are not published annually and therefore those for export have been inserted

TABLE II. — *Exports of Tea from the Producing Countries.*

(Million pounds)

	Year ending March 31					
	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38
<i>Countries bound by the agreement.</i>						
India (by sea)	379.8	317.1	323.4	313.6	303.3	328.5
India (by land for Iran)	1.3	5.5	14.5	5.9	3.9	1.3
Ceylon	258.8	197.0	220.2	215.9	200.3	222.0
Netherlands Indies	186.6	136.2	145.2	146.5	148.1	151.9
<i>Total</i>	<i>826.5</i>	<i>655.8</i>	<i>703.3</i>	<i>681.9</i>	<i>661.6</i>	<i>703.7</i>
<i>Countries not bound by the agreement.</i>						
China	91.4	91.5	102.0	91.0	90.3	70.5
Japan (1)	27.8	32.9	28.9	37.3	38.9	51.9
Taiwan (2)	14.9	16.0	21.5	20.0	21.6	21.8
French Indo-China	1.5	1.6	2.8	2.5	3.0	4.3
Nyasaland	3.0	3.7	5.4	6.7	8.6	9.9
Kenya	1.1	2.1	2.9	6.0	8.0	9.8
Other African countries (3)	0.3	0.3	0.4	0.6	1.5	1.7
<i>Total</i>	<i>140.0</i>	<i>148.1</i>	<i>163.9</i>	<i>164.1</i>	<i>171.9</i>	<i>169.9</i>
GRAND TOTAL	966.5	803.9	867.2	846.0	833.5	873.6

(1) Excluding exports to Taiwan and Chosen, for which no statistics exist.

(2) Excluding exports to Japan for home consumption, which are considered as internal trade.

(3) Mozambique, Union of South Africa, Uganda, Tanganyika.

Under these circumstances the Committee decided to raise the export quotas for 1937-38 from 82.5 (the percentage fixed for 1935-36 and 1936-37) to 87.5 per cent. of the standard export, thus returning to the percentage applied during 1934-35, the second year in which the agreement was in force. The Committee was of the opinion that when under conditions of regulation the market began to develop, the demand ought to be met by a ready supply, since otherwise the upward movement would be seriously hindered.

In 1936-37 the Committee continued its endeavours to persuade the other producing countries to adhere to the agreement. Success was only achieved, however, in regard to the East African Dependencies, which accepted the principle of restricting the expansion of the crop, and Malaya, which enacted regulations restricting the growing of tea.

The International Tea Market Expansion Board, set up in 1934 by the International Tea Committee with a view to co-ordinating the work of various organisations dealing with publicity, had very satisfactory results. Indeed, in all those countries where the consumption of tea increased, the Board had been responsible for publicity.

In 1937-38, the fifth year of the agreement's being in force, total exports amounted to 873,600,000 pounds, against 833,500,000 in 1936-37.

On the other hand there was a fall in absorption, the figures being 859,900,000 pounds against 890,800,000 in 1936-37. The United Kingdom was mainly responsible for this fall, stocks in customs warehouses having been largely withdrawn in the expectation of an increase in the tea duty. The fall in the United Kingdom's absorption was ascribed more to this cause than to any real fall in consumption, although the effect which the economic recession may have exercised on the consumption of tea should be allowed for.

As regards the decline in the absorption of the U. S. S. R. reference should be made to what was said above in examining the results for the previous year. That is, it is probable that this decline is merely apparent, and due to changes in the methods of compiling statistics.

In several other important countries increases in absorption occurred, although this is not to say that they were entirely due to an increase in consumption.

Stocks in customs warehouses in the United Kingdom, which had been 173,700,000 pounds on March 31, 1937 and 217,300,000 on December 31, 1937, fell again to 188,400,000 pounds (provisional figure) on March 31, 1938. Stocks in the Netherlands, France, Ireland and Canada which in 1937 were respectively 6,500,000, 2,300,000, 1,000,000 and 15,900,000 pounds were in 1938 4,100,000, 2,700,000, 100,000 and 18,000,000 pounds.

As regards the quotas fixed by the International Committee for 1938-39, the Committee, taking into account the relevant statistics and the fact that there was a grave frost in Northern India, recommended that the percentage of standard exports for 1938-39 should be increased from 87.5 to 92 per cent.

As a result of the regulations contained in the advisory memorandum signed in February 1933 by representatives of the signatories to the agreement, the International Tea Committee was empowered to study the trend of consumption and suitable means for its development. At the same time the Committee could

TABLE III. — *World Absorption of Tea.* ⁽¹⁾
(Million pounds)

Countries	Year ending March 31.					
	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38
I. — EUROPE						
United Kingdom ⁽²⁾	422.1	426.2	431.1	446.4	457.2	422.8
Netherlands	27.1	21.9	23.7	24.1	23.1	22.1
U. S. S. R ⁽³⁾	31.8	51.8	48.0	50.8	33.6	25.0
Ireland	22.6	24.8	21.7	22.3	22.0	24.5
Germany	10.0	10.4	10.4	10.3	9.9	11.1
Other countries	24.2	23.5	19.9	21.9	22.9	22.2
<i>Total</i>	537.8	558.6	554.8	575.8	568.7	527.7
II. — NORTH AND CENTRAL AMERICA						
United States ⁽⁴⁾	91.4	92.7	78.0	82.2	87.8	87.7
Canada	37.9	35.8	30.0	36.7	40.1	37.5
Other countries	3.0	2.3	2.8	2.5	3.0	3.0
<i>Total</i>	132.3	130.8	110.8	121.4	130.9	128.2
III — SOUTH AMERICA.						
<i>Total</i>	10.2	8.5	10.0	11.0	11.3	12.2
IV. — ASIA.						
Iran	9.6	9.8	14.0	11.2	15.8	19.8
Other countries	33.6	30.8	32.0	33.3	35.5	36.5
<i>Total</i>	43.2	40.6	46.0	44.5	51.3	56.3
V. — AFRICA.						
French Morocco	17.5	18.6	16.5	16.2	19.5	18.5
Egypt	13.8	12.7	12.7	13.5	16.9	16.3
Union of South Africa ⁽⁵⁾	11.9	11.6	11.6	14.1	13.6	15.0
Other countries	19.8	18.5	19.5	21.6	22.5	20.3
<i>Total</i>	63.0	61.4	60.3	65.4	72.5	76.1
VI. — OCEANIA.						
Australia	47.7	46.9	44.0	44.7	45.0	47.2
New Zealand	10.6	12.0	9.3	10.6	10.3	11.4
Other countries	0.7	0.7	0.7	0.7	0.8	0.8
<i>Total</i>	59.0	59.6	54.0	56.0	56.1	59.4
GRAND TOTAL	845.5	859.9	835.9	874.1	890.8	859.8

⁽¹⁾ Only those countries where the average for the last six years has been at least 10 million pounds have been included.

⁽²⁾ Quantities for home consumption only.

⁽³⁾ Gross imports.

⁽⁴⁾ Excluding Alaska and Hawaii.

⁽⁵⁾ Net imports of foreign tea.

recommend the most suitable measures to improve and develop production and consumption and, if necessary, to regulate the production of tea.

In virtue of these powers the Committee, after studying the whole position and considering all important factors, came to the unanimous conclusion that the market equilibrium aimed at in the 1933 agreement could not be entirely achieved by the end of the first five years' period, and that it would be necessary to continue to regulate tea. This view was approved by the associations representing the tea planters in the producing countries.

As a result, an agreement was signed on November 18, 1936 between the *Indian Tea Association*, (London), the *South Indian Association in London*, the *Ceylon Association in London*, the *Vereeniging voor de Thee Cultuur in Nederlandsch Indië* (Amsterdam), the *Nederlandsch Indische Vereeniging voor de Thee Cultuur* (Batavia) and the International Tea Committee. This agreement was later modified in respect of certain points, and the final agreement was signed on August 25, 1938.

TABLE IV. — *Stocks of Tea in Customs Warehouses.*

(Million pounds)

March 31	United Kingdom	Netherlands	France	Ceylon	Canada
1932	(¹) 240.0	7.5	1.1	(²)	4.6
1933	295.8	9.5	2.4	(²)	6.5
1934	273.2	6.9	1.5	(²)	11.7
1935	288.7	8.8	2.5	(²)	19.1
1936	249.5	7.8	2.3	1.1	16.6
1937	173.7	6.5	2.5	1.0	15.9
1938	188.4	4.1	2.7	0.1	18.0

(¹) Estimated

(²) Figures not available.

The new agreement regulates the production and exports of tea over the period from April 1, 1938 to March 31, 1943 in British India, Ceylon and the Netherlands Indies (including Java, Sumatra and the other islands in the Netherlands Indies).

The standard quantities of each producing country on which regulation of exports is fixed continue to be based on the maximum exports of tea from each of the producing countries in any one of the years 1929 to 1931. The standard quantities have been fixed at 383,242,916 pounds for British India, 251,588,012 pounds for Ceylon and 173,597,000 pounds for the Netherlands Indies.

The permissible exportable quantities are a percentage of the standard quantities fixed by the International Committee on February 28 of the year preceding the year of regulation or at a date as near this as possible. The Committee is empowered if circumstances require it to alter these quantities during the year for which they have been fixed.

As in the past, all exports of tea from the producing countries unaccompanied by an export licence are prohibited. Exports from India to Burma which, while the 1933 agreement was in force, were allowed without an export licence, from April 1, 1938, could only be made by licence.

Quantities of tea, the export of which has been authorized during a year of regulation but which have not been exported by March 31 of the year in question, may be exported up to May 31, provided that special licences are obtained not later than April 14. Such exports are treated as exports during the year in question.

The export from any of the producing countries of seeds, roots, stumps, cuttings, buds or any living portion of a tea plant which might be used to propagate it is prohibited, with the exception of seeds etc. exported for scientific purposes by one of the scientific institutions of the producing countries and provided that an export licence is obtained and that the institution to which the seeds etc. are directed is specified on this licence.

Production is regulated as follows. If the output of tea in one of the producing countries is greatly in excess of the quantity it is allowed to export, plus the amounts required for local consumption, the country in question must at once take all necessary measures to restrict this excess production.

Another regulation allows the infilling and supplying of vacancies on land planted with tea on March 31, 1938.

Replanting of tea is also permitted on land planted with tea on March 31, 1938 and on which the original bushes have been uprooted, or upon land planted with tea on March 31, 1936 from which the original bushes were uprooted since this date and which on March 31, 1938 was lying fallow in accordance with the usual planting practice.

The replacing of tea areas by planting new areas is not permitted.

By the new agreement the prohibition against selling or leasing further areas of tea cultivation, and planting tea on unplanted land or on land carrying other products, is continued.

Tea areas existing on March 31, 1938 may not be extended except for experimental or other special purposes on conditions laid down by the government, and with its consent. Such increases may not exceed in any of the producing countries one half per cent. of the total tea areas on March 31, 1938, except in the two cases outlined below.

Firstly, tea plantings which, during the period March 31, 1933 until the agreement expired in 1938, were permanently destroyed by subsidence, flood, river erosion, earthquake or other act of God; or have been taken over by the government or local authorities and no longer carry tea, may, with the consent of the government be replaced with an equal area of hitherto unplanted land. These areas are not included in the half per cent. mentioned above.

The second case in which the increase in the cultivated area is not included in this limit relates to the planting of nurseries. These may be permitted by the government, on areas not hitherto planted with tea, on condition that the total area of the nurseries does not exceed at the termination of the new agreement the area cultivated in this way on March 31, 1933.

Other clauses in the agreement regulate the powers, functions, duties and procedure of the Committee, the voting capacity of the representatives of the producing countries, and the basis on which their expenses shall be defrayed, etc.

We have given four tables showing the output, exports, absorption and stocks of tea throughout the period of the 1933 agreement ⁽¹⁾.

F, ARCOLEO.

INTERNATIONAL CHRONICLE OF AGRICULTURE

IRELAND

There are several indications that the general economic situation in Ireland improved in the first eight months of 1939 (1). The number of unemployment claims has been lower in each of the months February to August than in the corresponding months of 1938; the average for the first eight months of the year was 20,974 in 1938 and 20,010 in 1939 (2); for September, however, the figure for 1938 was 18,167 and for 1939 21,774. Of cardinal importance moreover is the fact that both the volume and the value of foreign trade in the first six months of the year were slightly larger in 1939 than in 1938.

The general index of agricultural prices (1911-13 = 100) which had risen from 104.9 in 1937 to 111.9 in 1938, stood higher in each of the first seven months of this year than in the corresponding months of 1938, the figures for January and June were 109.6 and 117.2 respectively this year and 104.1 and 112.1 in 1938. Export prices—more than three quarters of Ireland's exports are agricultural products—have been considerably higher than they were last year: in each of the first four months of 1938 the index of these prices (1930 = 100) stood at about 82, whereas in the same months of 1939 it was about 92, the May and June 1938 figures were 89.5 and 95, May and June 1939, 92 and 93.8 respectively, the June 1938 figure was, however, exceptional being almost five points above that of any other month of the year.

The rise in the price of cattle—the most important individual product of Irish agriculture—which was noted in the last Chronicle, has continued. The average price per live cwt. at Dublin market was 23s. in 1936, 29s. 6d. in 1937, 34s. 3d. in 1938, in January 1939 it was 35s. 9d. and since then has been in each month 37s. or more, the price in May rising as high as 43s. 3d. (May 1938 36s. 6d.).

The trend of the prices of feeding-stuffs has changed in favour of the farmer, the price of maize and of most concentrated feeding-stuffs having fallen. Moreover, the sharp rise in agricultural wages which took place in 1937-38 has slowed down in the past

(1) The figures of the first table are based on those given in the International Yearbook of Agricultural Statistics published by the International Institute of Agriculture, Rome, 1939.

The figures in the last three tables are taken from the Vth Report of the International Tea Committee.

(2) The period covered by the Chronicle; the last Chronicle for Ireland published in February 1939 referred to the second half of 1938.

(3) Figures for last Monday of each month.

year: the average earnings of a permanent male agricultural labourer over 21 during a week in July were 22s. in 1937, 27s. 3d. in 1938 and 27s. 6d. in 1939.

Price relationships have in general therefore moved in the farmer's favour.

Schemes of regulation of agricultural markets, prices and production continued until September on unchanged lines. In that month the scheme requiring the compulsory use of certain home-grown cereals in maize-mixtures was abolished ⁽¹⁾ and a new and stricter regulation of the quality of eggs came into force. ⁽²⁾ And at the same time international developments in the autumn led the Government to consider it necessary to increase the home production of food; provision was accordingly made for a compulsory increase in tillage and increase in the minimum price guaranteed for wheat. Other measures, such as the establishing of a licence system for the control of exports of various agricultural produce, new price controls, are also being taken ⁽³⁾.

External trade.

Development — The volume of foreign trade in the first six months of the year was in 1939 slightly larger than in 1938 though considerably smaller than in 1937, the monthly average for the first six months as a percentage of that for 1930 was 73.7 in 1937, 62.5 in 1938 and 63.6 in 1939.

The value of foreign trade was greater, in particular the increase in the value of agricultural exports referred to in the last chronicle has continued.

Value of Exports of Irish Agricultural Produce.

	January-June			January-August	
	1937	1938	1939	1938	1939
	£	£	£	£	£
Total	7,069,183	7,776,554	8,673,955	11,439,413	12,275
Of which —					
Cattle	3,467,252	3,853,993	4,368,039	5,280,192	6,115
Bacon and ham . . .	743,824	876,892	937,565	1,354,387	1,305
Butter	570,924	741,396	586,192	1,491,036	1,101
Eggs	619,654	780,284	889,639	1,020,717	1,083

The decline in the value of butter exports is to be noted. This is to be explained by a decrease in quantity not offset by rising prices, as was the fall in quantity in 1938. The quantity of butter exported in the period January-June was 143,572 cwt. in 1937, 129,816 in 1938 and 103,513 in 1939 and in January-August 278,129, 260,106 and 190,873 respectively. In part this decline may be the result of a different time distribution of exports, for the total butter exports in 1938 were roughly the same in quantity as

⁽¹⁾ See pages 29-30.

⁽²⁾ See pages 33-34.

⁽³⁾ Measures taken in face of the present international situation are in general not dealt with here, but will be the subject of a future Chronicle.

in 1937. The lower value of bacon and ham exports in the eight months January-August is due mainly to an exceptionally low volume of exports in July.

The rise in the value of total agricultural exports has been in large part due to the continued rise in prices.

Import restrictions — Various orders made in April and June prohibited imports, other than those made under licence issued by the Minister for Agriculture, of the following produce: *sugar* ⁽¹⁾, *pigs* ⁽²⁾, *raw tomatoes* ⁽³⁾, *onions* ⁽⁴⁾, *raw apples* ⁽⁵⁾. A levy on imported butter was fixed in February 1939 at 20s. per cent and was raised in March 1939 to 26s. ⁽⁶⁾. The restriction on tomato imports was removed on November 14, 1939.

Export regulations — From June 26 to August 31, 1939 the export of *potatoes* was freed from the control provided for by the Agricultural Produce (Potatoes) Act, 1931. This act provides for the inspection and certifying for grading and soundness prior to export. Usually, however, inspection is relaxed during July and August, a period in which the inspectors are busy examining growing crops for seed purposes.

The control of exports of *sheepskins* by a licence system was continued by an order in force for the period April 1, 1939 to March 31, 1940.

Export subsidies — The Minister for Agriculture has announced that, pending the result of negotiations in regard to the prices to be paid by British importers for Irish eggs, increased subsidies would be paid on eggs exported on or after October 1, 1939 until further notice. The new rates of subsidy are. For special standard selected ducks', 4s. per great hundred (previous rate 1s) pullets', 3s. per great hundred (previous rate 9d).

The rate of subsidy payable on exports of *seed potatoes* to countries other than the United Kingdom and the United States—no subsidies are paid on exports to these two countries—was fixed on April 1, 1939 at 17s. 6d. per ton. This is the same rate as that in force in 1938.

The change in export bounties on *dairy produce* is referred to in a following section on the dairy produce market.

Measures relating to the marketing of agricultural products.

Cereals. — The regulations which, since the passing of the Agricultural Produce (Cereals) Acts, 1933-35, have been in operation for the purpose of encouraging cereal-growing, were significantly changed in September 1939 when the maize-mixing scheme was abolished in accordance with a promise made by the Minister for Agriculture earlier in the year.

The *maize* scheme abolished in September 1939 had provided that all maize-meal mixtures should contain a certain percentage by weight of home-grown cereals. The

(1) Sugar (Prohibition of Import) Order, April 25, 1939, for period May 1 1939 to April 30, 1940.

(2) Pigs (Regulation of Import) Order, in force June 3, 1939.

(3) Tomatoes (Regulation of Import) Order, in force June 12, 1939.

(4) Onions (Regulation of Import) Order, in force June 1, 1939.

(5) Apples (Regulation of Imports) Order, in force November 7, 1939.

(6) See page 32.

purpose of this was to ensure a ready market at reasonable prices for home-grown barley and oats. Since 1933 the area sown to wheat has increased more than tenfold and the importance of oats and barley has declined both relatively and absolutely. And although it has been necessary to require only a low admixture percentage in recent years—it was 10 per cent in 1938, but was raised to 12 $\frac{1}{2}$ per cent. on May 29, 1939, and to 16 $\frac{2}{3}$ per cent on July 13, 1939—the regulation had been detrimental to the interest of the stockbreeders because firstly it tended to make the price of maize-meal higher than it otherwise would have been and, secondly, it restricted the freedom of choice of feeding-stuffs

The grower of *wheat* is guaranteed by law a minimum price and an assured market for his produce.

The minimum prices for the 1939-40 and 1940-41 seasons are the same as for the two preceding seasons ⁽¹⁾ Moreover the growers and millers agreed between themselves on minimum prices; the agreement reached in September 1939 provides for the same prices as those fixed in September 1938 ⁽¹⁾.

The assured market is provided by the regulation which requires that of the quota of wheat to be milled, allotted to each miller for each season a certain percentage shall be home-grown wheat. This percentage, fixed for each season (beginning September 1) by the Minister for Agriculture, was for 1938-39 first 35 per cent, but was reduced in October 1938 to 30 per cent. and further in February 1939 to 27 $\frac{1}{2}$ per cent. For 1939-40 it was first fixed at 30 per cent ⁽²⁾ but was raised on October 10, 1939 to 35 per cent. ⁽³⁾

This latter measure is supplemented by the regulations of the time distribution of millers' purchases of home-grown wheat. Orders are issued by the Minister for Agriculture, in agreement with the Minister for Industry and Commerce, fixing the percentages of the total home-grown wheat quotas to be purchased and taken into store before the end of certain months. The following percentages have been fixed for 1939-40

	October	November	December	January	February	March	April	May	June
1935-36	40	55	60	80	90	95	98	100	—
1936-37	25	40	55	70	85	90	95	100	—
1937-38	25	40	55	70	85	90	95	99	100
1938-39	20	35	50	65	80	90	95	99	100
1939-40	20	35	50	65	80	90	95	99	100

Each miller is moreover required to have available a given storage capacity for home-grown wheat; orders issued each season fix the capacity as such as to accommodate a given percentage of the home-grown wheat quota of the mill concerned. For 1939-40 the percentage is 65, for 1938-39 it was 60, for 1937-38, 54 and for 1936-37, 65.

⁽¹⁾ See the Chronicle for Ireland published in February 1939, page 80 for figures.

⁽²⁾ Statutory Rules and Orders 1938, No. 341.

⁽³⁾ Statutory Rules and Orders 1939, No. 310.

The change in the international situation led the Government to increase considerably the minimum price guaranteed for wheat. Wheat-growers are now assured a price of 35s. per barrel of 20 stones for wheat of the highest grade and equivalent prices for other grades. The highest price in schedule previously established for the 1939-40 and 1940-41 seasons was 28s. 6d. ⁽¹⁾

The price for malting *barley* for 1939 was fixed by agreement between the growers' association and the brewers, it is to be 23s. 6d. to 24s. 6d. per barrel of 2 cwt. The largest brewery in the country has moreover guaranteed that it will pay the same price in 1940 with an increase corresponding to whatever increase the Government may make in the guarantee price for wheat. This guarantee refers of course only to the requirements of this brewery viz. 400,000 barrels, or 800,000 cwt. ⁽²⁾

Flax. — Since the passing of the Flax Act in 1936 the flax-growers in Ireland have had a price insurance. At the end of each season the Government declares what, according to their investigations, was the average market prices for flax during the past season, this is the "ascertained price". If this is then lower by more than 3d. per stone than the "standard price" which is fixed by the Minister for Agriculture at the beginning of each season, a bounty equal to the price difference is payable to all registered growers who have had their flax scutched at registered scutch mills.

For the three seasons during which the act has been in force no subsidy has been payable. For the last season, October 1938 to March 31, 1939, the ascertained price was 9s. 6 $\frac{1}{4}$ d. per stone and the standard price 9s. 6d.

The standard price has, however, been increased. For 1936-37 and 1937-38 it was 8s., for 1938-39 9s. 6d., and for 1939-40 it has been fixed at 10s.

The total amount of any bounty that may become payable is limited by the fixing each season of a maximum quantity on which a bounty would be payable. This quantity has been fixed for 1939-40 at the same figure as that for the previous seasons, 240,000 stones.

Sugar-beet. — The prices to be paid for sugar-beet in Ireland are fixed each year by negotiations between the Irish Sugar-Beet Growers' Association and the Irish Sugar Company, a monopoly company on the Board of which are a number of Government appointed directors. Failing agreement the prices are fixed by an independent arbitrator.

For 1939-40, as for 1938-39, prices were in fact fixed by an arbitrator. It was considered that the Company's offer was fair and the price is accordingly to be 49s. 6d. per ton for washed beet with 17.5 per cent. sugar content with 3d. per ton increase or reduction for each 0.1 per cent. by which the content is over or below 17.5 per cent. The price for 1938-39 was 46s. 6d. and that for 1937-38, 37s. 6d. However, in 1937-38 the grower had the right to 1 $\frac{1}{4}$ cwt. of pulp free for every ton of beet delivered, but in 1938-39 had to pay at the rate of £ 3 a ton for pulp and in 1939-40 will have to pay £ 4.5s. per ton.

The price for 1940-41 has now been officially announced, for the first time in the history of the Irish sugar-beet industry the Government having taken upon itself the responsibility of fixing it. It is to be 60s. per ton. The grower has a right to 1 $\frac{1}{4}$ wt. of pulp for every ton of beet delivered but will have to pay at the rate of £ 5.5s. per ton for it.

(1) See the Chronicle published in February 1939 *op. cit.*

(2) The output of barley in Ireland is on the average about 2,400,000 cwt.

This gives the following comparative cash values of one ton of beet delivered and 1 $\frac{1}{4}$ cwt. of pulp returned, *i.e.* the price paid for beet less the cost of pulp received. 1937-38, 37s. 6d., 1938-39, 41s. 3d., 1939-40, 42s. 0 $\frac{3}{4}$ d., 1940-41, 50s. 9 $\frac{3}{4}$ d.

Tobacco. — Tobacco-growing in Ireland has been regulated since the passing of the Tobacco Act, 1934. A maximum total number of acres which may be planted is fixed each year. For 1939 it has now been fixed at the same figure as in each of the preceding years, *viz.* 1,500.

Milk. — The statutory minimum prices for milk that have so been far established for certain months of 1939-40 are at the same level as those for 1938-39 ⁽¹⁾.

Dairy produce. — The dairy produce market is regulated chiefly in three ways. First, in order to stabilise producers' returns bounties on exports are paid when the conditions of foreign markets warrant this, the funds being obtained from a levy on sales in Ireland. Second, statutory minimum prices are established for sale in Ireland. Third, the Government has since 1938 guaranteed the producers of the most important product, creamery butter, a given return.

The basis of these arrangements are various Dairy Produce (Price Stabilisation) Acts. The latest Amendment Act was passed in 1938; the main effect of this is to free non-creamery butter producers from liability to a levy and to make proprietors of butter factories and non-manufacturing exporters liable to pay a levy on their stocks of butter, including non-creamery butter.

In 1937 production of butter in Ireland decreased, and the market, particularly the export market, improved. And so, as we saw in an earlier Chronicle, the levies and bounties were gradually reduced to be finally suspended altogether in the winter of 1937, but were re-imposed in the summer of 1938.

The bounty on exported *creamery butter* was fixed at 4s. per cwt for May 1 to August 31, 1938, but an amendment made in January 1939 increased the rate for this period to 10s. From September 1 to November 30, 1938 14s. per cwt. was paid for the period December 1, 1938 to March 31, 1939 1d per cwt; and an order made in March 1939 fixed the rate for a period beginning April 1, 1939 at 7s. 6d.

The Stabilisation Fund from which this bounty is paid is supplied by levies on dairy produce sold in Ireland. The last order issued on this subject fixes the levy at 11s per cwt. but exempts from levy all butter put into cold store before September 30, 1939, under and in accordance with an agreement sanctioned by the Minister for Agriculture. This rate came into force on June 1, 1939. An order made in the same month of 1938 fixed the rate at 6s., with a similar exemption.

A levy on imported butter was established in February 1939 at 20s. per cwt., raised in March 1939 to 26s.

The statutory minimum price for creamery butter has been increased recently. In May 1938 it was fixed at 138s. per cwt., in December 1938 at 147s. This was to be the price for lots of not less than 20 cwt., that for smaller amounts being 4s. higher in both cases. In May 1939 a change was made, the higher price being made payable for amounts up to 30 cwt.

In June 1938 a specially low price was fixed for butter placed in cold storage before September 17, 1938; the price was 132s. 6d. *i.e.* 5s. 6d. below the current minimum

(1) See the Chronicle published in February 1939, page 82-1 for figures.

for large lots. Similarly in June 1939 a lower price was fixed for butter taken into cold store before September 30, 1939, this was 136s. 6d., i.e. 10s. 6d. lower than the current minimum for large lots.

A levy on butter stocks was fixed in December 1938 at 9s. per cwt. for creamery butter and non-creamery butter equally. The proceeds of this go to the Price Stabilisation Fund.

In August 1939 it was announced that a subsidy of 8s. per cwt. would be paid on all creamery butter manufactured during the month of July. A similar subsidy of 5s. per cwt. was paid on creamery butter manufactured during certain months of 1938, beginning with August, the object of this was said to be the encouragement of winter dairying.

The bounty on *cheese* exports was fixed in May 1938 at 5s. per cwt., but an order made in January 1939 raised the rate on full cream cheese (raw and processed) to 19s. leaving the rate on other cheese at 5s. This change had force from September 1, 1938. A subsequent order, of March 1939, made the bounty on all cheese exported on or after April 1, 1939 5s. per cwt.

The levy remains at 5s. per cwt. on raw cheese and 7s. per cwt. on processed cheese.

Pigs and bacon — The supply and prices of bacon, pigs and bacon are regulated by the Pigs Marketing Board and Bacon Marketing Board, set up under the Pigs and Bacon Acts, 1935-37. The Pigs Marketing Board fixes, two prices, an "appointed" price which is an actual price for pigs and carcasses of pigs sold to factories or otherwise, and a "hypothetical" price, which is the price the Board considers "would under normal conditions be the proper price thereof." Should the hypothetical exceed the appointed price each licensee or registered minor curer has to pay the Board a levy calculated on the basis of the price difference. The money so received by the Board is used to make payments to licensees or minor registered curers when appointed prices exceed hypothetical prices.

Hypothetical prices have in general been appreciably higher in the first nine months of 1939, than in the corresponding period of 1938. Appointed prices have been about the same as in 1938.

Levies to be paid by bacon curers during the second half of 1939 and the first half of 1940 are 3d. per carcass to the Bacon Marketing Board and 1d. per carcass to the Pigs Marketing Board. For the first half of 1938 the rates were 4d. and 1d. respectively.

The quotas for the quantity of production and of home-sales are about the same as last year.⁽¹⁾ Bacon export quotas were considerably smaller in the summer of 1939 than in the summer of 1938, and export quotas for live pigs were much greater.

Eggs. — The eggs market was one of the first to be regulated by a special measure, an act passed in 1924 providing for official inspection of eggs marketed, for fines when eggs are put on sale in an unsatisfactory condition and for the registration of egg exporters. The powers of official control were extended in 1930 by the Agricultural Produce (Eggs) Act of that year; it was then provided that the premises of egg preservers should be registered. These measures were taken with a view primarily to improving the quality of eggs exported; now a new act, the Agricultural Produce (Eggs) Act, 1939 has been passed, related more closely to the home market.

(1) See Chronicle published in February 1939, page 84, for annual figures.

The producer is directly affected by the new act: it becomes an offence for him to sell dirty or bad eggs or to wash or steep eggs for the purpose of cleaning them, or to keep or store eggs intended for sale, under conditions which do not protect the eggs from wet, heat, dirt or contamination.

The dealer, who collects eggs from producers for sale to wholesalers, has to be registered and must dispose of eggs within 72 hours from their acquisition.

The wholesaler, who acquires eggs for export or for sale to retailers on the home market, has to be registered and must test the eggs, within 48 hours, and dispose of them within 72 hours from their acquisition. He must mark and sell Second Quality eggs as such, and he must place a code-mark on eggs showing the period within which they were tested on his premises. The retailer will thus have a reasonable assurance that eggs (other than those marked Second Quality) purchased from a registered wholesaler are fresh when he receives them.

The retailer is required to examine all eggs received by him within 48 hours, and to mark as "Second Quality" all eggs found to belong to that category. A retailer who acquires eggs directly from a producer is also obliged to mark such eggs (unless already suitably marked by the producer) with a code-mark representing the period within which they were examined on the retailer's premises.

Measures relating to agricultural production.

Compulsory increase of tillage — An order has been made under the Emergency Powers Order, 1939 requiring the occupiers of holdings of ten or more statute acres to have 1/8th (12 1/2 per cent.) of arable land in cultivation in 1940, whether or not any portion of the arable land was tilled in 1939. For the purposes of the order tillage crops are: cereals, potatoes, roots, other green crops, flax, fruit, vegetables, but first or second year rotation grass and orchards in grass do not rank as tillage crops.

The Minister in a statement concerning the order said that considerable increases in crop production were necessary; in particular at least 200,000 extra acres of wheat 400,000 extra acres of barley and oats and 25,000 extra acres of sugar-beet. The acreage of wheat in 1938-39 was 258,100 acres, total corn crops 869,700 and total corn, root and green crops 1,478,200.

Loans for implements. — In connection with the increased tillage scheme the Government has announced that it is endeavouring to provide an extended scheme of loans for the purchase of implements.

Fertilizer schemes. — At the beginning of 1939 the Minister for Agriculture introduced a scheme under which farmers can purchase certain fertilizers at reduced prices. The scheme applies to the following fertilizers manufactured by the Irish Fertilizer Manufacturers' Association having their factories in Ireland: superphosphates (including potassic superphosphate) Semsol, Ground North African Phosphate, Compound and Complete Manures shown in the price list of the Association.

The price reduction is 10s. per ton for all except the last class, for which it is 5s. per ton. Later the Fertilizer Manufacturers' Association decided itself to give a rebate of 5s. per ton on the last class, so that there was in fact a price reduction of 10s. per ton on all fertilizers mentioned.

The scheme was introduced for the period September 1, 1938 to June 30, 1939, and an amount of £40,000 was set aside by the Department of Agriculture for this purpose. It was eventually extended, but terminated on August 1, 1939.

A new modified scheme was put into force on October 20, 1939. A reduction of 10s. per ton is to be granted to farmers on superphosphate (35 per cent.), potassic superphosphate, and compound and complete manures shown in the Fertilizer Manufacturers' Association's price list.

In addition to this scheme there has been in force for several years a lime subsidy scheme whereby the Department for Agriculture offers to local committees of agriculture grants to supplement provisions made by them for the purpose of encouraging the production and use of lime for agricultural purposes. The Department set aside for the purpose £9,500 in 1936-37, £8,000 in 1937-38 and £30,000 in 1938-39.

This is related to the Land Reclamation Scheme in force since 1932 ⁽¹⁾.

NORWAY

The agricultural year 1938-39 was not so favourable for Norwegian agriculture as 1937-38. The harvest in 1938 was larger, it is true, than that of 1937, which was the largest recorded up to that time, but its quality was poorer, and price relationships were less advantageous to the farmer. It will be seen from the table below that the price level of agricultural products remained in 1938-39 practically the same as in the preceding year, but that simultaneously there was a rise in the general index number of prices of farm and household requisites and a considerable increase in agricultural wages.

As a consequence of these movements of the prices of agricultural products and means of production the earning capacity of Norwegian farms—as seen from the accountancy figures published by the Royal Society for the Welfare of Norway—was less than in 1937-38. It will be seen from the figures that for a number of identical farms surveyed by the above-mentioned Society both in 1937-38 and in 1938-39 the average net return expressed as a percentage of the capital invested fell from 5.22 per cent. in 1937-38 to 3.27 per cent. in 1938-39.

Turning our attention to the present agricultural year 1939-40 we meet with harvest results less satisfactory than those of 1938—according to preliminary data, the average for all crops was 96 per cent. of that for normal years—but, so far, with a favourable development of prices of agricultural products, farming and household requisites; for agricultural wages no index figures have as yet been published. It will thus be seen from the table, that whereas the general price index of farming and household requisites rose from 168 in July to 172 in October (1900=100), the price level of livestock products increased from 158 to 165 and that of crop products considerably more, viz. from 146 to 169. For all agricultural products taken as a whole the index number rose from 156 in July to 169 in October 1939.

Measures relating to the marketing of agricultural products.

There has been little change in the past year in State regulation of markets and prices of agricultural products in Norway. All the measures in force in that year have been retained unaltered in principle, and the only noteworthy new measure is

⁽¹⁾ See the section on Ireland in *World Agricultural Situation 1938-39*, by the International Institute of Agriculture, Rome, now in press.

Index Numbers of Agricultural Prices (¹).

(1909-1914 = 100)

	1936-37	1937-38	1938-39	1939			
				July	August	September	October
Cereals	155	174	168	163	170	170	170
Potatoes	133	189	174	146	127	184	217
Hay	155	116	100	111	102	140	144
Crop products	147	116	156	146	141	168	169
Milk	147	167	169	163	167	167	168
Pigmeat	113	121	133	140	141	153	153
Other meat	154	195	185	175	171	185	176
Eggs	108	118	119	103	122	133	145
Livestock products	140	100	162	158	161	165	165
General price-index of agricultural products	142	162	161	156	157	166	169
Fertilizers	90	98	100	98	93	93	94
Concentrated feeds for dairy farms	131	144	155	160	159	156	164
Concentrated feeds for pig-raising	128	141	149	149	147	146	157
Building materials	167	178	176	174	174	177	180
Machines and implements . .	189	204	207	210	210	210	210
Farming requisites	144	156	162	164	162	162	166
Household requisites	161	175	174	175	176	177	180
General index of prices of farming and household requisites	151	164	167	168	168	168	172
Wages	162	189	202	—	—	—	—

(¹) Indices prepared by the Institute of Farm Management and Agricultural Economics of the Agricultural College of Norway

a law, passed in June 1939, concerning the manufacture and sale of potato meal; this has, however, not yet been put into effect.

In order to encourage *cereal* production and to regulate the prices of cereals and their derivatives, a State monopoly of the imports of wheat, rye, barley and oats and their milling products was established by a law of June 22, 1928, and the State monopoly was required to purchase all home grown cereals offered for sale and to pay for them the c. i. f. price of imported cereals in Norwegian ports plus certain price subsidies. This monopoly was maintained during the period under survey and the farmers have been paid the following prices for the various home grown cereals: for wheat 24 crowns per quintal, for rye 22 crowns, for barley 20 crowns, and for oats 18 crowns up to February 26, 1938, 17 crowns up to August 25, 1939 and after that date 19 crowns.

Subsidies similar to those mentioned above are also paid to all growers for cereals sent by them for grinding in local mills for their own consumption -- a measure which is, in fact, much more important for the majority of Norwegian farmers, as only a small number of them grow cereals in quantities sufficient to leave them with marketable surpluses worth mentioning. The subsidies which were fixed when the law first came into force at 4 crowns per quintal for all cereals have since been increased from time to time. For cereals milled at the local mills for home consumption the subsidy is 5 crowns per quintal for wheat, rye and barley and 3 crowns for oats (except in certain coastal districts where also for oats the subsidy paid is 5 crowns). Besides this ordinary subsidy, since 1936-37 there has also been an emergency subsidy, on not more than 15 quintals per farm, of 4 crowns per quintal for wheat and rye and of 2 crowns for barley and oats. In some mountainous districts and in Northern Norway, however, the emergency subsidy paid for barley amounts to 3 crowns per quintal.

The *milk and dairy produce market* is regulated by the following measures introduced in the preceding years: the tax on all milk sales, the equalisation tax on milk sold for direct consumption, the compulsory admixture of butter with margarine, the tax on margarine and other butter substitutes, the prohibition of import of butter, condensed milk and milk powder, the imports regulation by a licence system of animal fats, the State subsidies for replacing margarine by butter in the army, the hospitals and almshouses and for the increasing of the milk consumption among the poor strata of the population.

The milk tax introduced by a law of June 6, 1930, is levied on all milk offered for sale, the proceeds are utilized for the promotion of the co-operative marketing of milk and milk products. When first introduced it was 0.2 öre per litre of milk; later it was raised to 0.25 öre and in 1930 to 0.3 öre per litre.

The equalisation tax levied on all milk for direct consumption is used to equalise the producers' price of milk sold for butter and cheese manufacture with that for milk for liquid consumption. This is probably the measure which has contributed most to a stabilization of the Norwegian milk market. The tax is fixed and levied by the eight so-called milk centrals of the country, which at present comprise about 95 per cent of all milk producers; it may not, however, exceed certain maximum amounts prescribed by the Government for the different districts. The average price paid to producers for milk at present amounts to 18.3 öre per kilogramme.

The law on the compulsory admixture of butter with margarine came into operation at the end of 1931. The percentage of butter to be added was at first fixed at 2 per cent. only, but was later increased, during 1938-39 it has varied between 18 and 22 per cent. and in August 1939 it was raised further to 24 per cent. The surplus butter, which earlier was disposed of mainly on the export market, has in recent years been utilized almost entirely for admixture with margarine.

The tax on margarine and other substitutes for butter was introduced in 1934, the proceeds are used to support the dairy industry in various ways. The tax has remained at the same rate as in previous years, 10 öre per kilogramme diminished or increased by 1 öre per kilogramme for each per cent. of admixture of butter to margarine above or below 10 per cent.

Of the other measures mentioned for the support of the milk market, the State subsidy for the increase of milk consumption among the poorer classes of the population may be especially mentioned. This subsidy makes it possible to reduce the price of whole milk by 5 to 25 öre per litre according to the price of milk in the locality concerned and to the economic situation of the recipient, and in most places to give necessitous persons skimmed milk entirely free.

The *pig meat and mutton market*, whose 90,000 suppliers are organised in the Norwegian Pig Meat and Mutton Union, has continued to receive State aid in various ways. There are, for example, the State subsidies for increasing the consumption of pig meat among the less well-to-do classes. Then there is a levy on all pig carcasses and on all native mutton passing an official meat control inspection, as well as on native mutton intended for salting and sale. The proceeds of this levy go to the promotion of the co-operative marketing of the products mentioned. The levy during the period under survey was for whole pig carcasses of more than 15 kilogrammes 1.50 crowns and for half carcasses or smaller animals 0.75 crowns, for mutton, 0.50 crowns for whole carcasses or less.

The co-operative marketing of *eggs* has, as previously, been encouraged by State subsidies up to half the costs to co-operative egg producers' societies of arrangements for the storing of eggs and the improvement of quality. To encourage exports bounties have been granted, funds for which have been provided by a levy on concentrated feeding stuffs, described below. To be entitled to the bounty, the exporter must hold an export licence.

The *levy on the purchase of concentrated feed*, whether foreign or domestic, is intended to prevent the over-production of foodstuffs of animal origin and to encourage the home-growing of fodder crops. The amount of the levy varies according to the conditions of the world market—when import prices are falling the levy is increased, when they rise it is reduced—but can in no case exceed 6 öre per kilogramme. Certain quantities are exempted. Small farms whose annual purchases of concentrated feeding stuffs do not exceed 1,200 kilogrammes, for instance, obtained, exemptions from the levy on the following quantities: 3 quintals per head for cattle and horses of two years or over, 1 quintal per head for cattle and horses from four months to two years of age, 2.5 quintals per head for pigs for breeding; 1.5 quintals per head for porkers, 0.40 quintals per head for goats, etc. For farms purchasing annually more than 12 quintals of concentrated feed the quantities exempted are lower.

The sole noteworthy new measure concerning the regulation of prices and markets to be reported is, as we have said, the law of June 16, 1939 on the *regulation of the manufacture and marketing of potato meal*. This empowers the Government to fix prices for this product, to limit its production and to make quality regulations, to grant licences for its manufacture and, if it is found expedient, to compel the producers to market their products through a common single organisation. The law has, however, not yet been put into operation.

Agricultural credit.

Two important temporary laws concerning agriculture credit described in the last chronicle, were prolonged for one year: the law of June 29, 1934 on loans for voluntary and compulsory settlement of farmers' debts and for the conversion of loan secured by mortgages on farm holdings, up to December 31, 1940, and the law of May 28, 1937, amending the law of July 23, 1915, on the granting of loans to small farmers in straitened conditions to facilitate the formation of small holdings etc., up to July 1, 1940.

BIBLIOGRAPHY ON ECONOMIC AND SOCIOLOGICAL SUBJECTS

GÜNTHER, Hans F. K. *Das Bauerntum als Lebens- und Gemeinschaftsform* Leipzig and Berlin, G. B. Teubner, 1939. VIII + 673 pp.

Whereas in North America rural sociology already developed into a separate branch of science some decades ago, in the European countries comprehensive descriptions of this branch of agricultural science have as yet been lacking. Certainly there is no shortage of isolated studies and monographs, which in Western Europe are mostly based on the researches of the noted sociologist L. e. Play, whilst in the German-speaking areas Riehl, Solmrey, von Wiese and Ipsen have been the most authoritative names, not to mention such writers of novels of peasant life as Jeremias Gotthelf who, however, can also supply valuable material for sociological research.

Now, however, Hans Günther, the well-known authority on racial studies has provided us with a work which for the first time attempts a systematic and comprehensive description of the German peasantry from a sociological standpoint. In accordance with the fundamental ideas of the present Reich and the principles embodied in the new German legislation on hereditary holdings the author considers only that genuine peasantry which is firmly bound to the soil, and not all sections of the rural population as do the American writers. Günther does not see in the peasantry merely a group of people like any other, but considers them as the very foundations on which state and nation are based. From this it naturally follows that in the handling of his material the author gives special prominence to biological, racial and hereditary problems, without, however, for that reason neglecting the spiritual and psychological aspects of peasant life. The contrast between the fundamental viewpoints of the city-dweller and of the peasant is strongly emphasised by the author, for it is part of his purpose to make the German city-dweller better acquainted with the peasantry by a careful analysis of peasant life and ways.

As material for his book, which is dedicated to the Reich Peasant Leader Darré, the author refers to and quotes from an extraordinary number of writings from the most different branches of knowledge and from all periods and countries. For this reason Günther's work offers not only an excellent basis for a study of this new branch of knowledge, but constitutes also a most important work for reference as which its use is facilitated by a most complete index arranged according to names and to materials. We may assume that this work will help to give the study and research into rural sociology as important a place in future as that already held by the study of agricultural economics.

S. v. F.

SAPPER, KARL, *Die Ernährungswirtschaft der Erde und ihre Zukunftsaussichten für die Menschheit*. Ferdinand Enke, Stuttgart, 1930, XI + 160 pp.

This work forms the fifth volume of the series "Strömungen der Weltwirtschaft" (Tendencies in the World Economy) edited by Professor Ernst Schulze. In the first chapter the author devotes his attention to the part played by the seas as a source of foodstuffs for mankind, and shows that in comparison with the foodstuffs derived from the land those coming from the sea are of declining importance. Thus, for example, F. Fels estimates the total catch of all the fisheries of the world at a minimum of 10.5 million tons, which, although an impressive enough figure in itself, is only about one quarter of a German potato harvest.

In the following chapter "Man's Nourishment from the Mainland" the author considers the problem of erosion in parts of the world which have as yet remained more or less unaffected by man. From this he proceeds to a description of the more important of the various ways in which man has provided himself with foodstuffs—the stages of the lower and higher gatherers and hunters, the cultivation of the soil, the rearing of live-stock—and their effects as regards the preservation of the fertility of the soil. Whereas under the hunters and gatherers men obtain their means of life in general without any adverse effects on soil fertility, the author shows how under the various

stages of agriculture and stock-farming the consequences are far less happy. Examples are cited from different parts of the world of the devastating effects of soil erosion resulting from over-stocking, destruction of the forests, short-sighted methods of agriculture, and of the resulting loss of great areas for purposes of food production. For example, in the U. S. A. alone the formerly cultivable land which has been largely deprived of its fertility by erosion covers an area three times as great as that of the whole German Reich.

In a following section "The Problem of the Maximum Possible Population of the World" the author considers the possibilities of foodstuff production provided by the tropical and temperate zones. His conclusion is that the tropics under the present conditions of their agriculture are hardly able to maintain a greater population than that supported by equal areas in the favourable parts of the temperate zone. According to his experience the productive possibilities of the tropics have been over-estimated, and principally because of this factor he considers the figure for the maximum possible population of the world given by Penck and Hollstein (8 and 13.3 milliards respectively) as too high. Furthermore the author does not share the viewpoint upheld by many laymen and doctors that not only Southern but also Northern Europeans can settle down in the tropical lowlands.

In the section "The Fight against Food Scarcity" the author describes the measures adopted in Germany for the increase of food production and the degree of success which has attended them. The work closes with the author's views on the "Planned Utilisation of the World's Soil", wherein he stresses the need for an increased international co-operation in order to preserve soil fertility and to increase and rationalise the food production of the Earth.

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MONTHLY BULLETIN

OF

AGRICULTURAL ECONOMICS AND SOCIOLOGY

THE CONSEQUENCES OF MOTORIZATION IN FARMING

The consequences of the increasing use of machinery in farming have perhaps not been fully realized, for the good reason that they have not all had time to manifest themselves clearly; they have, however, already formed the subject of numerous discerning analyses.

Knowledge of the consequences of agricultural motorization is less advanced: the phenomenon is more recent and no special study appears to have been devoted to the matter as it is generally confused with the consequences of mechanization, without considering whether this confusion is legitimate. This is precisely the problem which will be discussed in the following study. Is motorization a new phenomenon, quite distinct from mechanization? Even if the answer should be in the negative, are its effects exactly similar or should important shades of difference be noted?

It is a simple matter to reach agreement about the definition of the phenomenon; motorization does not consist in the introduction of motor power to farm work, because farming has never been able to do without it, but in the substitution of inanimate for animate motor power, in the substitution of the muscular energy of man or beast by the energy deriving from the combustion of fuel or electricity. Here again it must be admitted that for many centuries farm work has sometimes been performed by water or wind power, or, in other words, by inanimate motor power; yet such devices were uncommon and confined to an extremely small number of farms. The phenomenon under consideration is therefore new, less from the technical than from the sociological standpoint; from being exceptional it has grown to be common. Time alone can show whether it will eventually become general. The novelty lies in its extension to large numbers of farms; instead of mere individual results, motorization will lead to mass results which will react upon the the market and the situation of part of the farming population.

One point is beyond discussion: motorization presupposes mechanization; the former is merely the extension and completion of the latter and could not appear as an isolated factor. This explains why its effects have as a rule been identified with those of the machine, but there is nothing to prove *a priori* that it does not alter certain effects of the use of machinery and that it will not have additional consequences of its own.

In the following article it is proposed to draw a parallel between the two phenomena, to study their similarities and differences and so to find a reply to the questions asked above.

I. — Similarities between Motorization and Mechanization.

At first sight it would appear that mechanization and motorization have a good deal in common as regards their sphere of action, they both appear to be applicable to small and large-scale farming. As a matter of fact, this view can be accepted or opposed according to the definition given of motorization. If it is taken in the strict sense of the term, as a substitution of simple animal power by the inanimate motor, which, at the present stage of its development means in practice the use of the tractor, then it will be admitted that motorization seems to be confined to medium-sized and large farms and does not come within the scope of the small farm. If, however, the term is taken in its wider sense—the substitution of inanimate motor power for the muscular energy of man and beast—it will be seen that a low-powered motor suffices for many types of farm work, and that the small farm too is in a position to purchase a petrol engine or an electric motor with which to pump water from a well and operate the separator or seed grinder. Leaving aside for the moment the co-operative aspect which will and even now sometimes does permit of the small farmer's making use of high-powered and expensive motors at small cost, it would appear that at the present time motorization is accessible to the small farm. This is due to technical progress, in addition to the steam engine, for long the only type of engine in use, there are now also low-powered motor engines marketed at a moderate price, and this has opened up a wide field for the application of motorization.

Nevertheless all the defects and limitations of mechanization in agriculture are shared by motorization; the latter is just as incapable of eliminating those essential features of farming which constitute its inferiority to industrial production: namely that agricultural production always means slow and hazardous production.

Mechanization has not shortened the process of growth in plants and animals. The wheat ear sown in land ploughed by a horse-plough does not grow any more quickly than in ground which has been dug by a man wielding a spade, and the tractor will in no way hasten the moment when the wheat is ready for reaping. In the same way the animal which eats seed crushed by motor will not fatten any more quickly than if the seed had been crushed by hand.

Neither does the action of machinery and motor power appear to have any mitigating effect on the risks to which production is subject. The seriousness of this fundamental weakness of farming is well known. In certain cases there is a possibility of reducing the gravity of this factor. It appears that most vegetable products are affected by the "care" given to the soil during preparatory field work and to the plant during the period of growth, in the form either of top-dressing or of fungicidal treatment. A certain number of accidents can be eliminated. Now, not all of these operations are considered by the majority of farmers as normal and belonging to their ordinary routine. Very often no auxiliary equipment is considered necessary for their execution;

they are done "any old way", and as the season during which they can be done is very short it often happens that times pass and they are left undone. The introduction of the tractor, with which this type of work can be done at great speed, will enable it to be carried out each year and this will tend to make yields more regular. This will be one good result from motorization ⁽¹⁾.

Another restriction on mechanization in farming is the very slight effect it has in increasing yields. Indeed, mechanization originated and has now attained its greatest development in those parts of North America where extensive farming is practised; as matters stand at present, mechanization appears to go hand-in-hand with low yields and is in any case perfectly compatible with them. Yet here again, what is true of mechanization is not necessarily true of motorization.

In the first place, machinery can help to increase the yield from a given crop by making it possible to till the land more satisfactorily and to bring in the harvest at the right moment. The tractor here enhances the effect of the machine by increasing the speed with which the work is performed. It must, however, be admitted that the progress made in this direction has been slight and is likely to remain so.

On the other hand, an examination of production obtained from a given area and not the yield of a given crop, shows that cultivation by machinery, and by motorization in particular, has another and completely different aspect: motor power makes it possible to create conditions which a machine operated by hand or animal power could not produce, and these conditions will make production possible in places and at a times where it was formerly impracticable. For instance, certain areas of the Roman Ager remained uncultivated until the traction engine made it possible to break up the thick hard outer crust; here the motor has in very truth created the soil ⁽²⁾. Again, in areas where irrigation is indispensable and where the natural slope of the ground cannot be utilized, it is obvious that the use of powerful pumping plant operated by a motor creates completely different conditions: where formerly the water was drawn up hand over hand in pails, or a chain pump operated by a donkey was used, the petrol engine or the electric motor ⁽³⁾ increases the productive capacity of the soil ten-, twenty- and a hundred-fold. The engine thus makes it possible to cultivate land which was previously sterile. On land which has already been cultivated the engine can be used to speed up preparatory field work so that two crops can be obtained on the same ground in one year; in certain areas of the lower valley of the Po, in fact, a rice or maize crop can be produced after a wheat or clover crop, if the first harvest can be brought

⁽¹⁾ In this connection, see LIERMANN: Report submitted to the XVth International Congress on Agriculture, Budapest, 1934, page 139.

⁽²⁾ ALBERTARIO, PAOLO: Report submitted to the XVth International Congress on Agriculture, Budapest, 1934, proceedings, page 157.

⁽³⁾ HOFFEN, H. G.: Electricity in Agriculture. *Monthly Bulletin of Agricultural Science and Practice*, 1938, No. 8, International Institute of Agriculture.

in and new sowings completed within a week ⁽¹⁾. With the aid of machinery this can often be done, but with the aid of motorization it will always be possible. In all these cases the engine is a factor for increasing agricultural production ⁽²⁾; and although these may not be very frequent cases, yet they should not be overlooked for in them the engine is found to be more efficacious than machinery.

The engine may produce the same effect in other ways. Labour power is released by the increase in operating speed. What is to become of this surplus energy? On a large concern employing several wage-earners, the farmer takes advantage of the situation to dismiss those of his staff who have become superfluous, these workers will seek new employment and not necessarily on a farm; it is impossible to foresee whether in this case agricultural production is likely to be affected. But when the same thing happens on a small farm, operated by members of the family, the staff is not sent away; free time is instead created and, in view of the arduousness of the peasant's work, this free time is not utilized for recreation, it allows him to devote his attention to types of work which would otherwise be neglected owing to lack of sufficient labour ⁽³⁾. Lastly, machinery constitutes "a means for the intensification of production" ⁽⁴⁾. But, contrary to what might be expected, the engine appears to have had less effect than the machine. It has, as a matter of fact, replaced animal power much more than man power and has done more to free animal traction than to free labour done by man. This has already been noted as regards wheat harvesting by tractor: "The introduction of the tractor has had much less effect than the harvester" ⁽⁴⁾. This remark is of general validity. Here, then, the engine has a very slight effect on the volume of agricultural production. Can the same be said in connection with the reduction of costs—the great advantages offered by the machine and which causes its defects to be overlooked? Does motorization present the same advantages?

We shall deal only briefly with the indoor farm engine. It may operate a machine the work of which was formerly done by man power, such as a separator or a seed grinder. Except under very unusual circumstances it only operates for a short period daily, the introduction of the engine consequently lightens the physical effort of the person who formerly performed the task, but it does not allow that person to be dispensed with altogether, because he has other work to do, no reduction in staff may be considered under these circumstances and the costs remain unaltered and may even be increased by amortization on the engine and consumption of fuel or electricity. But the motor can also operate a heavy machine (thresher, press, etc.), which was formerly operated by animal power. It was in this field that the motor made its first conquests. Its effectiveness in lowering costs was obvious, and today no one denies that the engine is more economical than the draught animal.

⁽¹⁾ ALBERTARIO, PAOLO. *op. cit.*, p. 155.

⁽²⁾ In this connection, cf. DRAGONI: *Economia agraria*, pp. 194, 195

⁽³⁾ Cf. HÜNT: XVIth International Congress on Agriculture, proceedings, p. 170.

⁽⁴⁾ BOUCKHAERT: XVIth International Congress on Agriculture, proceedings, p. 111.

The problem discussed nowadays is that of the engine operating in the fields, in other words, the tractor. Repeated experiments showed that the tractor fulfilled some of its promise, as the following examples show.

According to a report by Prof. Paolo Albertario ⁽¹⁾, it cost 30 lire per hectare to mow a meadow with animal traction and 25 lire with a tractor. In the same two cases, harvesting costs 60 and 35 lire per hectare respectively. Ploughing with a team of two oxen costs 160 lire per hectare, the price falling to 40 lire when the work is done by tractor.

The following figures are the result of observations made on a 240 hectare farm in the Ile de France in 1937 ⁽²⁾: The preparation of the ground and wheat sowings with a horse team cost 171 francs per hectare; with a tractor drawing a 6-share plough, a sowing machine, and a harrow, the same operations cost 110 francs, with a consequent saving of 61 francs or 35 per cent. Harvesting with a reaper-binder drawn by 3 horses and threshing at the farm with a thresher cost 326 francs per hectare; with a reaper-thresher these operations only cost 170 francs. The saving amounted therefore to 156 francs, equivalent to 47 per cent. Transport of a 35,000 kilogramme crop of beet a distance of 3 kilometres cost 464 francs when done by a horse and cart and 250 francs by tractor and trailer, realizing an economy of 44 per cent.

These remarkable results should not, however, raise too high hopes.

An analysis of costs resulting from the use of an engine and a machine shows at once that about one half of these costs consists of amortization on the material. It must be admitted that the importance attributed to amortization is arbitrary as long as the material under consideration is fairly new, there being no standard of experience by which to gauge the effects of long usage ⁽³⁾. Costs vary considerably according to whether the amortization is based on wide or narrow estimates.

It is not sufficient, however, to consider isolated operations; an attempt must be made to ascertain the saving effected on production as a whole by the tractor and the machine. This is where disappointment begins. On the farm mentioned above it was estimated that the use of a tractor, a 6-share plough and a reaper-thresher reduced the cost per quintal of wheat by 7.75 francs ⁽⁴⁾.

In that year, 1937, the price of wheat was fixed in France on a basis of 180 francs per quintal and Manitoba No. 1 was worth some 130 francs on the Winnipeg market in December of the same year. Motorization therefore results in only an insignificant saving. The reason for this appears to lie in the fact that farming consists essentially in making plants and animals grow and that in this field the engine has so far proved just as powerless as the machine.

Motorization and mechanization have therefore many similarities, although this does not prevent the existence of certain shades of difference. To complete

⁽¹⁾ ALBERTARIO, PAOLO: *op. cit.*, p. 155.

⁽²⁾ FROMONT et BONGARD: *L'activité économique*, July 31, 1938.

⁽³⁾ It should be added that very often estimates of costs neglect outlay on repairs.

⁽⁴⁾ FROMONT et BONGARD: *op. cit.*

the analysis an attempt will be made to identify these differences, bringing into relief the innovations resulting from motorization and showing where its consequences differ from those of mechanization.

II — Differences between Motorization and Mechanization.

A first and somewhat unexpected difference is to be found in connection with amortization. A motor is generally considered as being more expensive than a machine. It has already been observed that its purchase is just as much within the mean of the small farm as that of the machine. It should be added that its amortization is less burdensome. The amortization of a machine is especially heavy because it is a very highly specialized instrument which can be used for one operation only. Two different machines are required for two operations as closely connected as the mowing of fodder crops and the reaping of cereals; generally, therefore, each machine operates for a few hours only each year, while it depreciates more in proportion to calendar time than to actual service; each operating hour is therefore heavily burdened. The motor, on the contrary, is much less highly specialized; undoubtedly every engine cannot be used economically to run every machine, considerations of power affect operation, but generally speaking, a farm owning an engine with a few horse power for indoor farm work and a medium powered tractor for field work and threshing, may be considered, at the present stage of technical progress, as being adequately motorized. Each of its engines, in view of its mobility, will be used for very different operations, will operate many machines and will work more hours per year than each of the machines. Running costs will therefore be distributed over a larger number of units. Amortization will be reduced and in this sense the engine is more economical in farming than the machine.

On the other hand the engine suffers from the disadvantage that it requires a special operating outlay not required by the machine; purchase of fuel or electric power. With the machine, the invested capital often runs to high figures, since each farm has to purchase a whole series of mechanical implements, but at least the annual outlay is moderate; the cost of oil for greasing the parts is not very high and if the machine is well constructed expenditure on repairs will as a rule be quite small. The use of an engine presents quite different economic conditions, as heavy expenses are incurred daily. In the example of a farm in the Ile de France given above, the preparation of the ground and sowings cost 330.30 francs per hectare; over and above this sum, fuel-oil and oil amounted to 95 francs ($70 + 25$); harvesting with the harvester-thresher came to 511 francs for 3 hectares including 89.50 ($66.50 + 23$) for fuel-oil and oil; transport of the beet crop from 1 hectare of land came to 259 francs, 89.50 of which went on fuel oil and oil ($66.50 + 23$); in these various cases the expense for fuel-oil and oil came to 28 per cent., 17 per cent. and 34 per cent. (¹)

(¹) Electricity costs may run into large figures. In the United States in 1937, average annual consumption for farms to the west of 100° Longitude (where irrigation is practised), came to

Its importance lies more in the fact that it is an outside purchase than in its volume. Of course, animals do not work for nothing; in fact, their work is very costly; but their upkeep does not involve any actual outlay by the farmer, no funds are expended; the motive power utilized originates in grain and fodder crops consumed by the animal and produced on the farm itself. As long as an engine consumes fuel-oil which cannot be obtained from the woods or the fields on the farm the farmer will have to disburse large sums. The inherent risks involved in this type of operation are well-known: there is nothing connecting the price of fuel-oil with that of the agricultural produce sold to pay for it. Of course, it is not to be excluded that some years the price of fuel-oil may fall and that of farm products rise; such years are, however, rare in the memory of farmers and the annals of statistics; the famous case of the price scissors is much more usual: *i. e.* the price of supplies used by farmers rises, while that of what he sells falls. In this respect the use of an engine aggravates the situation, increasing dependence on markets and so making the position of the farmer more unstable. The machine, on the other hand, makes the farm more independent, as the whole of the work can often be performed with the assistance of the permanent staff alone, thus releasing the farm from the need for seasonal labour.

Lastly the engine differs from the machine in the type of power which it economizes; the energy released by the machine was mainly man power; the engine, as a rule, replaces animal power. This is something quite new. The machine never competed with the draught animal; on the contrary, it extended the use of animals to the mowing of fodder crops and the reaping of cereals, work which had formerly been performed by man. This addition to the work of draught animals would as a rule lead to an increase in livestock for draught purposes; and the farms which wished to continue "working" their land as in the past did indeed increase the number of their teams. Then came the swing of the pendulum again. The engine is a direct rival to the horse, the mule and the ox; in the example of the farm in the Ile de France described above, the purchase of a 40 HP caterpillar tractor and a 35 HP road tractor made it possible to dispense with 6 out of 18 horses and to sell all the 12 oxen used up till then.

This reduction in the number of animals will lead to a series of very grave phenomena affecting the farm, agriculture and even society.

The internal balance of the farm is disturbed. The draught animals work and produce manure, though the latter function has always been considered of secondary importance, since in the nature of things draught animals must pass a great deal of time in the fields and it is mainly the produce-yielding stock, stalled for the whole or part of the year, which produces the manure. But in so far as horses, mules and oxen also provide manure, the reduction in their numbers leads to the danger of an inadequate output of organic manure, and so threatens the fertility of the soil on the estate.

5,180 KWH. Consumption by farms to the east of this line was only 1010 KWH. In California and Arizona where irrigation is highly developed, consumption ran from 12,000 to 13,000 KWH per farm. *Monthly Bulletin of Agricultural Science and Practice*, August 1939, p. 310.

In some cases the farmer may attempt to obviate this danger by adopting a solution which appears to be logical and at the same time to satisfy technical and economic requirements. This plan consists in making up for the reduction in draught stock by a corresponding increase in produce-yielding stock. In fact, in the example considered above, the 6 horses and 12 oxen disposed of were replaced by 12 milch cows; in this way the production of manure was kept at its former level, and a considerable income received from the sale of surplus milk. No fault can be found with this method, and as long as it remains an individual plan it is very satisfactory. It loses, or runs the risk of losing, all its merit as soon as it becomes generalized; for this would result in a big increase in the volume placed on the market—in the case under consideration the 12 milch cows have been added to an initial herd of 18 animals, with an increase in the output of milk, therefore, of 66 per cent.; and yet this was a case of only partial motorization. The price of the product cannot be maintained except under certain definite circumstances: a rapidly increasing population or an elastic demand with a rising purchasing power. Except under these circumstances, production will increase and prices collapse. The method adopted to save the farm will be useless to save agriculture as a whole. Agriculture is vainly seeking a way out of the dilemma raised by the motor; to produce grain and fodder either for draught animals which are no longer required, or for feeding produce-yielding stock for which the consumer has no need.

At this stage the problem ceases to be purely agricultural and begins to affect society as a whole. Since only a part of the land used for the upkeep of draught animals can be usefully turned to account for producing meat, milk, wool and eggs, no use can be found for the greater part. The machine drove man from the farm and obliged him to change his occupation, but it never eliminated him from the earth's surface; in driving him to the workshop it only prevented him from remaining an agricultural producer and turned him into a consumer. The motor drives livestock from the farm, and the matter turns out to be infinitely more serious because as soon as the animal ceases to be useful it is no longer produced⁽¹⁾; the motor will have reduced the number of farm consumers fed on grain and fodder crops. While the machine has deprived men of their employment, it is the land itself which is put out of work by the motor. What will it be used for now? The future will find a solution which will not necessarily be unfavourable to farming interests; it still remains to be discovered, however.

Conclusion.

Are any conclusions to be drawn from the above comparison of motorization and mechanization?

The use of the motor in farming has been developing for about twenty years; conditions inevitably recall the similar phenomenon which took place

⁽¹⁾ A. Drive, laying special emphasis on the case of Belgium, even maintains that the reduction in births of colts will be greater than the reduction in the demand for horses and that the value of the latter will therefore be lowered. (*Economie rurale*, p. 128).

more than a century ago in industry; numbers of intelligent people believe that the consequences will be the same and that agriculture, too, has just entered upon a period of revolution; after the industrial revolution at the end of the XVIIIth and the beginning of the XIXth centuries, comes the agricultural revolution at the beginning of the XXth century⁽¹⁾. From the above analyses it would not appear that this opinion is justified.

The effects of the use of the motor are subject to the same essential limitations as the machine; it is found to be incapable of eliminating or even of attenuating to any extent the variability of crops; it does not increase the rate of agricultural production, which still remains excessively slow in comparison with the rate of industrial production. It leaves yields unaltered and when it renders an increase in production possible, the ratio of increase is still extremely small, never exceeding a fraction per unit, while in the industrial field the motor has multiplied yields by 10,100, 1,000 and 10,000. Better results appear to be obtained in lowering expenses, operating costs being reduced by about 50 per cent. but these costs represent only a tiny fraction of the total outlay.

A significant point which strengthens the impression that the engine, at the present stage of technical progress, can hardly be considered as a revolutionary force is the fact that it affects animals rather than man. Horses, oxen and mules are rendered useless and not man. Man is affected in the long run, as the reduction in numbers of livestock results in land lying idle and consequently in the unemployment of those who cultivate it. But he is only affected on the rebound, the land acting as shock absorber in so far as another use may be found for fodder crops; it is therefore logically conceivable that a reduction in draught stock will not lead to human unemployment. But the future tense must be used. The decline in numbers of draught animals has nowhere assumed the aspect of a major phenomenon; even in the United States, numbers of horses and mules only fell from 21,800,000 to 15,200,000 during the period 1920-1939, setting free 13 million hectares of land. Since the agricultural area of the United States amounts to 357 million hectares, this factor has not affected the crop balance very seriously. In the field where the motor might play a revolutionary part, its action is barely perceptible; this is a problem for tomorrow rather than for today.

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⁽¹⁾ Cf. GUMPERS: *Die Agrarkrise in den Vereinigten Staaten*, ch. VI «Die industrielle Revolution in der amerikanischen Agrikultur», cf. also, VIATOR: *La Révolution agricole aux États Unis* et en U. R. S. S. *Revue politique parlementaire*, January 1932.

EXPORTS OF AGRICULTURAL PRODUCTS FROM BULGARIA

Introduction.

Bulgaria is an agricultural country, almost 80 per cent. of the population being peasants. It is also a country of smallholdings, since only 10.61 per cent. of these are of more than 10 hectares in area. The land is very much broken up and farming is extensive with a definite tendency towards the production of cereal crops giving low yields. The population increases much more quickly than the demand for farm labour and *per capita* income is decreasing steadily. The position is somewhat improved by the development of industrial crops, which require more labour, and by industrial progress. Cereals still constitute the most important form of production, however, while the area sown to industrial crops is often increased at the expense of fodder crops, to the detriment of stockbreeding.

Wheat is the principal crop produced in Bulgaria, the harvest generally yielding about 1.5 million metric tons, 6 to 8 per cent. being exported. Maize ranks second in importance with a yearly production of 900,000 metric tons, from 10 to 12 per cent. of which is exported. Other cereals raised are rye, barley and oats, the yields varying between 100,000 and 200,000 metric tons, all consumed on the home market.

A much smaller area is sown to industrial than to cereal crops, but the commercial value of the former is high, especially in the case of tobacco, which ranks first among Bulgarian exports. Tobacco was not very important as an export before the Great War, but in the past twenty years production has greatly increased and varies from about 20,000 to 40,000 metric tons annually. From 20,000 to 25,000 metric tons are exported. A similar increase has been registered in the sunflower crop, the oil produced now almost entirely replacing olive oil, while large quantities of the seeds and by-products are exported. Other important crops are sugar beet, which is not exported, colza and, more recently, the soya bean, which is still open to development. From 500,000 to 600,000 quintals of French beans are grown annually, 5 per cent. of this amount being exported.

Poultry farming, stockbreeding, grape growing, the production of attar of roses, fruit and vegetable cultivation and sericulture are other branches of Bulgarian agriculture which contribute to the country's exports.

Poultry farming was carried on even before the liberation of Bulgaria, at that time chiefly by the Turks. The organisation of poultry farming is still somewhat primitive, but although yields are only mediocre, output is nevertheless quite large. After the Great War eggs were the second item on the list of Bulgarian exports, while killed and live poultry also took a prominent place on the list.

Stockbreeding has declined owing to the fodder shortage resulting from the increase in industrial crops. Exports of livestock are on the downward trend and confined principally to large animals, the smaller animals being used on the home market. The breeding and export of pigs, on the other hand, is tending to increase.

Grape production, although previously almost unknown has been steadily increasing for the past ten years in Bulgaria, which now occupies one of the foremost positions among grape-producing countries, and exports are developing rapidly. The production of other fruits is also on the upward trend, the chief exports of this class being plums, apples, walnuts and recently, strawberries prospects for this last fruit are very promising. Vegetable production is increasing and exports, although formerly rather exceptional, are gradually gaining in importance.

Rose-growing is a Bulgarian monopoly, but since very little perfume is manufactured in the country, the output of attar of roses, which is used in the preparation of perfumes, is almost all exported; this industry is, however, meeting increasing competition from chemical substitutes.

Sericulture developed considerably after the Great War, most of the production being exported; but the world economic crisis led to a fall in exports. There has recently been an increase in the demand for real silk, which may open up interesting prospects for Bulgaria.

Rice and cotton production develop steadily. The standard value of Bulgarian cotton is only 5 per cent. below that of the finest cotton grown elsewhere.

Bulgaria's natural resources leave room for considerable industrial progress which should be to the advantage of the country as a whole, agriculture included.

Government interest in industry steadily increases. The first law for the encouragement of national industry was promulgated in 1894, many amendments having been added since then. Instead of making customs protection the main basis of industrialisation, an attempt has been made since 1936 to accomplish this by improving the organisation of production.

The crisis had an unfavourable effect on the development of Bulgarian industry after 1930, but industrialisation is still making progress as a result of protective tariffs.

Bulgarian industry is economically of very great importance for the country as it is closely allied to agriculture, forestry, quarrying, stockbreeding and the exploitation of mineral resources. Its effect on agriculture is so great that farmers in Bulgaria are now replacing cereals by oil-producing plants and textile crops such as cotton, flax and hemp. The cultivation of sugar beet and certain plants producing essential oils helps to improve the breeds of sheep and cattle, etc., as well as contributing to an increase in the farmer's income which is of especial importance nowadays, in view of the fall in cereal prices. Some 60,000 workers are employed directly in industrial production.

Foreign Trade before the 1929 Crisis.

The development of Bulgarian foreign trade after the Great War may be divided into four periods: the first, a period of reconstruction, runs from 1919 to 1922 in the case of exports and from 1919 to 1923 for imports. The second, a period of relative stability, includes the years from 1922 or 1923 to 1929. The third period, from 1930 to 1934, is marked by the economic crisis and the

depression which followed. The fourth, from 1934 to the present time, is a period of recovery.

During the first period foreign trade developed considerably in comparison with the war years, but political events in 1923 had an unfavourable influence on trade and especially on exports.

The second period is characterised by a great increase in trade as a result of government loans—in 1926 for the settlement of refugees and in 1928 for the stabilisation of the currency.

Imports fell off enormously during the third period due to the crisis and restrictions, while the volume of exports continued to increase owing to the drop in the prices of agricultural produce, reaching a maximum in 1932.

Since 1934 Bulgarian foreign trade has been making a slow recovery and the trade balance has returned to parity. The following table illustrates the development of foreign trade from the Great War the until 1939

Bulgarian Foreign Trade from 1920 to 1938.

Year	Imports		Exports		Balance
	thousand tons	million levas	thousand tons	million levas	million levas
1920	127	2,255	185	2,056	— 199
1921	182	2,976	287	2,801	— 175
1922	282	4,066	385	5,926	+ 1,860
1923	355	5,154	337	4,343	— 811
1924	392	5,678	390	5,876	+ 198
1925	446	7,834	321	6,242	— 1,592
1926	311	5,631	399	5,618	— 13
1927	312	6,197	467	6,627	+ 430
1928	360	7,109	368	6,231	— 878
1929	505	8,325	302	6,397	— 1,928
1930	313	4,590	534	6,191	+ 1,601
1931	293	4,660	763	5,934	+ 1,274
1932	261	3,471	586	3,383	— 88
1933	230	2,202	427	2,846	+ 644
1934	246	2,247	396	2,535	+ 288
1935	276	3,009	327	3,253	+ 244
1936	283	3,181	569	3,910	+ 729
1937	325	4,929	687	5,020	+ 91
1938	382	4,934	500	5,578	+ 644
1939	389	5,197	544	6,065	+ 868

Until the end of the last century the Bulgarian trade balance was always adverse, but after 1900 there was a favourable surplus except during the period from 1906 to 1914. After the Great War two distinct periods may be observed: one from 1919 to 1929, was a period of adverse balances, especially during the years immediately following the war. This situation was caused by the large quantities of imports, many of which were utilised for the industrialisation of the country. After 1930 the trade balance again registered a favourable surplus

with the single exception of the year 1932. It should, however, be observed that this situation was due to the great effort made to export goods and to the considerable reduction in imports. It was not until 1936 (on the basis of 1926 prices = 100), that prices of goods for export were higher than those of the products imported. The period from 1920 to 1938 closed with an active balance of 3,200 million levas, while the period from 1920 to 1929 showed a deficit of 3,100 million levas. The satisfactory balance during the last few years, as described above, is due to the fact that trade with the various countries was evenly balanced as the result of the clearing agreement policy which gave an increasingly bilateral aspect to trade.

During the first years after the Great War Bulgarian trade exchanges were very restricted. The general structure of Bulgarian import trade was characterised by the large sums spent on imports of textiles, textile raw materials, metals and manufactured metal articles. Subsequently textile imports fell off while metal imports increased until pre-War percentages were reached.

Exports suffered greatly during the Great War and afterwards remained very small as agricultural production had not recovered and trade relations had not returned to normal. The war between Turkey and Greece led to an increase in Bulgarian exports; and in 1922 Bulgaria exported 257,000 tons of cereals with a value of 1,880 million levas; 29 million kilogrammes of tobacco with a value of 1,170 million levas; and 6 million kilogrammes of eggs worth 483 million levas. Average prices for cereals and eggs were very high and the year's accounts closed with a favourable balance amounting to 1,900 million levas.

In the following year exports fell by about 1,500 million levas, while imports increased by 1,000 million levas. The fall in the value of exports was due to the fall in the prices of cereals and to competition from Greece and Turkey as regards tobacco exports; so that Bulgaria found herself with an unstable tobacco market and able to export no more than 17 million kilogrammes of tobacco. The balance of trade therefore became once again heavily passive.

Although in 1924 and 1925 the volume of exports was greater than in 1922 and the favourable trade balance for 1924 amounted to 200 million levas, the 1925 trade balance showed a deficit of 1,600 million levas owing to the large increase in imports; this was also a record year for tobacco exports which totalled 33.5 million kilogrammes (an amount which was only equalled in 1938); egg exports also increased.

Trade returns balanced in 1926 as imports had been reduced to meet the decrease in tobacco exports.

In the period 1927-1929 exports reached their highest level owing to the high prices obtained for tobacco and eggs. This situation led to a rapid increase in imports which reached the record figure of 8,300 million levas in 1929.

The increase in imports led to the exhaustion of supplies of currency in the National Bank of Bulgaria, which thus had to reduce credits. This situation and the beginning of the economic crisis led to a severe reduction of imports in the following years.

Taken as a whole Bulgaria's foreign trade has not altered much since 1878, since, as has been seen, she continues to export agricultural and to import indus-

trial products. Cereals, however, no longer constitute the most important export item as they did before the Great War; they have been replaced by industrial crops and the products of poultry farming and stockbreeding. On the other hand, as was shown above, textile products and metals still contend for the first place among imports, although as a rule raw materials are now imported instead of the finished product.

The most important products exported are tobacco, cereals, eggs and hides. Cereals, which before the Great War represented 70 per cent. of exports, have now fallen to 25 per cent., sometimes even going below 20 per cent. Tobacco, on the other hand, was little known before the Great War, but has developed in a remarkable fashion and now heads the list of exports. Many other new exports have become important, such as colza and sunflower seeds, cocoons and hides. Eggs, which were fairly important as exports before the Great War, have become increasingly so as time went on.

After the Great War the output of cereals in Bulgaria was slightly greater than in the pre-War period. There is still room for development and the government has taken measures to encourage output by supplying farmers with agricultural machinery, building silos and carrying out irrigation schemes in the valleys of the Maritza, Topolnitsa, etc.

Stockbreeding has not progressed as it should have done, the number of live-stock having remained stationary although the population has increased by 50 per cent. during the period from 1910 to 1927. This is not only due to the very primitive methods adopted, but is also the result in large measure of the fodder shortage.

Livestock censuses for the post-War period show the following figures, in thousands of head:

Class	1910	1920	1927
Horses	478	398	411
Mules and donkeys	131	181	187
Buffaloes	413	448	430
Cattle	1,606	1,877	1,867
Sheep	8,669	8,923	9,906
Goats	1,465	1,332	1,639
Pigs	527	1,090	1,118

The Crisis Period.

Since Bulgaria is populated mostly by peasants living on the produce of the land, it might be thought that it would not be affected by world conditions. Nevertheless world conditions have a strong influence on Bulgaria and the economic crisis had a serious effect on the country. This economic upheaval led to a very sharp decrease in the value of foreign trade and to changes in its composition. In 1930 the value of foreign trade amounted to 10,800 million levas as against

14,700 in 1929. One of the items most seriously affected by the crisis was wheat, and the sudden fall in the price of agricultural produce caused considerable loss.

The world crisis was felt in Bulgaria as elsewhere through the fall in prices which began towards the end of 1929, but it was not really felt in the sector of agricultural produce until 1930 and only in 1931 in that of industrial products. This rendered the position of the peasant more difficult by producing the "scissors" phenomenon. The crisis was at its worst in 1934, and since then there has been steady improvement.

As a rule the development of Bulgarian foreign trade reflects the trends of world trade as illustrated in the following table

Index Numbers of the Value of World and Bulgarian Trade.

(1929 = 100)

	1929	1930	1931	1932	1933	1934	1935	1936
World trade	100 0	80 8	57 7	39 0	35 2	33 5	34 1	34 6
Bulgarian trade . .	100 0	73 2	72 0	46 6	34 3	32 5	42 5	48 2

From the above figures it will be seen that Bulgarian foreign trade suffered less from the crisis than international trade, but that this difference is not very great. The years when Bulgaria was most seriously affected were 1933 and 1934, but the improvement observed immediately afterwards was much more marked in Bulgarian foreign trade than in world trade. This situation had an adverse effect on agriculture, produce being exported in much larger quantities in order to counterbalance the fall in prices.

Bulgaria's share in world trade rose from 0.16 per cent. in 1929 to 0.20 per cent. in 1936. A decrease occurred in regard to imports as compared with pre-War figures. The industrialisation of the country has, however, reduced imports of finished goods, while imports of raw materials and machinery have increased.

As has already been seen, cereals were the first Bulgarian products to be affected by the world crisis, followed by other agricultural products and then by trade and industry. The area sown to crops increased by 5 per cent. between 1908 and 1912, while that sown to cereal crops increased by 10 per cent., but cereal exports fell off seriously owing to a 27 per cent. increase in population. This increase in population also affected the composition of exports because, owing to the greater consumption of cereals, tobacco has now taken first place among products exported. Nevertheless cereals are still of great importance for Bulgarian foreign trade, since they are shipped to countries with free foreign exchange. The economic crisis, by occasioning a fall of some 40 per cent. in the price of agricultural produce, aggravated the situation in Bulgaria,

the more so because the rise in the price of products required by farmers made the position of Bulgarian agriculture very precarious. In order to remedy this situation the State established an office for the purchase and sale of cereals through which large quantities of cereals were bought from the producer at prices above the world quotation.

Subsequently the crisis affected other farm produce, and also industrial crops, which occupy the second place in Bulgarian production. The fall in price was not so marked, however, and in any case industrial crops give a return three times greater than that obtained from cereals.

Viticulture is becoming more and more important for Bulgaria, especially as the products offer a vast field for exportation. Table grapes sell well, mostly on markets with free exchange such as the United Kingdom.

The production of fodder crops was not affected by the crisis but, as has already been explained, it does not cover the needs of the home market. Every other crop suffered from the crisis. Although the production of vegetables increased, their value dropped. Cocoon production, which had been very important, was seriously affected by the crisis and prices fell by one third. Rose-growing underwent a period of forced inactivity since not only did prices fall but even purchases ceased almost entirely.

As a result of this upheaval, the government decided to take steps to assist producers. The first to be helped were the tobacco growers. Following a cabinet decision the Bulgarian Agricultural Bank purchased tobacco for the State at fixed prices, above those ruling on the market. In 1932 the Bank purchased 500,000 kilogrammes of the 1931 crop. The Bank also bought almost all the 1932 production of cocoons for the government, and fixed the price of rose blooms at 7 levas per kilogramme, purchasing 90 per cent. of the crop, which passes through the hands of the co-operative associations. Measures were also taken to reduce the price of industrial products for peasants, but they met with difficulties arising from taxation and the lack of elasticity in prices of raw materials and labour.

Imports fell off by 40 per cent. in 1930 as a result of the crisis, while the value of exports remained unaltered, although their volume increased by 40 per cent. The stability of the total value of exports was due to the fact that larger quantities of foodstuffs, cereals, fruit and vegetables and of manures and waste products were exported in 1931. Exports of other products, on the other hand, such as animal produce, attar of roses, hides and their derivatives, textiles and their derivatives, etc. fell off considerably.

By the law of May 19, 1932, the government placed very severe restrictions on imports and allowed only 50 per cent. of the 1931 volume of imports to enter the country. Control was in the hands of the National Bank of Bulgaria which regulates foreign trade. Although this measure led to an abrupt reduction of trade, it succeeded in considerably restricting imports.

The National Bank of Bulgaria was also obliged to adopt restrictive measures for the control of foreign exchange. By the law of October 26, 1930, an office was established for the purchase and sale of cereals and the results of this innovation were very satisfactory. This office is an independent government institu-

tion attached to the cabinet; it purchases wheat, rye, oats, barley and millet through the co-operative associations, the people's banks and grain merchants at prices higher than those prevailing on the international market and sells these products abroad through its agents, to export merchants, or to the mills. These operations have resulted in a loss to the State of some 750 million levas representing the financial aid given to cereal producers.

Only wheat and rye were purchased by the office after October 24, 1931, a bonus of 0.50 leva per kilogramme being paid on maize. On February 28, 1932, the export bonus on maize was abolished and after July 22, 1932, the office restricted its purchases to wheat. In 1933 it purchased 78,062 tons at an outlay of 193,527,469 levas, selling at 191,879,590 levas.

The office purchased 258,000 tons of wheat and 7,000 tons of rye from the 1933 crop at 1.38 levas per kilogramme above the world quotation. After 1934 the office exercised a monopoly over the wheat and rye crops.

The office, which was converted into an organisation with legal status by the law of February 7, 1936, also handled industrial and oil-producing crops, cotton, hemp, flax, rice and sunflowers until the end of 1938, its efforts resulting in a considerable development of these crops during the past few years.

Bulgaria has therefore been transformed from an importer of hemp into an exporter of this product, and as a result of the expected increase in production, hemp will probably become an important item in Bulgarian trade. Cotton production has also increased considerably.

The office was able to increase the income of producers by 5,500 million levas, and thus prevented the agricultural crisis from having too serious an effect on Bulgarian farming. Its activity has also contributed in large measure to the satisfactory organisation of the cereal trade in Bulgarian by ensuring a sufficient quantity of cereals for the needs of the population.

Among the measures taken by the Bulgarian Government to protect foreign trade, mention should be made of the creation of the Export Institute, which was established by the law promulgated on October 2, 1935. It is a State institution under the aegis of the Ministry of Commerce, Industry and Labour and is the supreme organ handling the government's export policy. The institute has stimulated the export of various new products such as strawberries, raspberries, apricots, peaches, quinces, rice, tomato conserve, white tomatoes, dried mushrooms, live and slaughtered pigs, tallow, bacon, fats, turkeys, fine quality cheeses, hemp, woodwork, goods produced by craftsmen, etc., it also gives information concerning the prospects and demand on new and old markets. Most of these new products are exported to new markets such as England, Sweden, Norway, Finland, Denmark, the Netherlands, Argentina, etc., which bring free foreign exchange into the country.

Bulgarian trade, as we have seen, is showing a tendency towards the exportation of industrial crops, tobacco in particular, and an attempt is being made to encourage these exports. Attention is also devoted to exporting eggs, cocoons, fruits, poultry, livestock, attar of roses, etc., to foreign markets. With this end in view clearing agreements have been concluded and negotiations are now in progress concerning the conclusion of others.

Bulgaria has also had recourse to export bonuses; these are given only to producers of cereals and of some other less important products. Railway tariffs have also been reduced, but as most of the export trade passes through the Danube and Black Sea ports, these measures have not had much effect.

As regards the regulation of imports Bulgaria has generally preferred to avoid increasing customs tariffs and instead to compel industry to purchase home-produced goods. Severe control has also been exercised over payments in foreign currency made through the National Bank of Bulgaria. Under the laws of July 1, 1929, and October 15, 1931, a certain portion of the currency which comes into the country must be ceded to the Bank, which supplies importers and other interested parties with funds. Import quotas were introduced in 1933 through a system of permits.

As from 1933 imports of many products were permitted only against exports of Bulgarian products under a system of private compensation outside the established quotas. These imports may amount to between 50 and 100 per cent. of the value of the exports concerned.

The policy as regards trade agreements adopted by Bulgaria after the Great War may be divided into three periods. During the first of these, ending in August 1925, Bulgarian trade policy was subject to restrictions in favour of the "Allied and Associated Powers". At that time Bulgaria limited her negotiations with other countries to the conclusion of trade conventions containing bilateral recognition of the most-favoured-nation clause. Conventions of this description were concluded with Hungary, Norway (1921), Denmark, the Netherlands, Germany, Spain and Austria (1922). During the second period Bulgaria did not sign any regular commercial treaties except with Turkey (1930). Trade agreements on the basis of the most-favoured-nation clause were concluded with the following countries: France, Czechoslovakia, Italy, the United Kingdom, Belgium, Palestine (1925), the British Colonies (1926), Albania, Japan (1927), Latvia, Estonia (1928), Romania (1930) and the Italian Colonies (1931) and a trade and navigation agreement with Poland (1927).

Bulgaria also concluded an economic agreement with Greece in 1927, which was, however, denounced in the course of the subsequent economic war between the two countries.

Beginning with 1931 Bulgaria started adjusting her foreign relations by entering into commercial agreements on the basis of a preferential customs tariff and the quota system. The first agreement, concluded with Germany, came into force on February 3, 1933. This was followed by agreements with Czechoslovakia (April 14, 1934), Yugoslavia (July 1, 1934) and one with Italy (October 18, 1934), renewed in June 1939. On January 5, 1940 a trade agreement was concluded with the U. S. S. R.

As many countries were unable to effect their international payments in free exchange currency it became necessary to find another method of meeting these obligations, and this situation eventually led to the establishment of clearing agreements.

Bulgaria was forced to adopt the above system in order to adjust her financial relations with other countries, because on the one hand, her exporters had

large credits blocked abroad while, on the other, she had extensive commercial and financial obligations towards other countries. The clearing agreements adjusted her various international engagements, and in some cases even left a certain margin of free currency.

As a rule the clearing agreements regulate payments for imports and exports of merchandise, either on a basis of full compensation or by reserving a part in free exchange currency for Bulgaria. They also contain clauses regulating former obligations. The execution of these agreements, most of which also provide for private compensation arrangements, is handled by the National Bank of Bulgaria.

Bulgarian trade has benefited greatly from these trade and clearing agreements, but the latter have resulted in a reduction of free exchange currency entering the country besides obliging Bulgaria to import mostly from countries purchasing Bulgarian goods, namely, the Central European countries and chiefly Germany and Italy. The Bulgarian National Bank has therefore attempted, and with satisfactory results, to stimulate exports towards countries with free exchange through the system of private compensations.

Clearing agreements have now been concluded with the following countries: Germany, France, Hungary, Italy, Turkey, the Belgo-Luxembourg Economic Union, Yugoslavia, Switzerland, Finland, Greece and Estonia. The clearing agreement concluded between Bulgaria and Spain on November 20, 1934, was renewed in January 1940.

Trade Recovery.

As has been shown above, Bulgaria suffered considerably from the world crisis, the most serious consequences being felt in 1933 and 1934. As may be seen from the table on page 52 Bulgarian foreign trade began to improve after 1934, growing more normal as a result of the changes which have taken place since the crisis. As has already been explained, cereals, which formerly took first place, have now been replaced by industrial crops and especially by tobacco. A comparison of the distribution of the value of the most important exports by products in the two periods 1907-14 and 1933-37, will also show this.

I. - *Percentage of the principal Export Products.*

Average 1907-1914		Average 1933-1937	
Product	Per cent	Product	Per cent
Cereals	66.0	Tobacco	37.2
Non-vegetable foodstuffs	10.4	Fruits and vegetables	14.5
Animals	5.6	Cereals	15.6
Various textiles and embroidered goods	6.0	Non-vegetable foodstuffs	17.7
Miscellaneous	12.0	Animals	2.9
		Miscellaneous	12.1

In 1938 and 1939 the distribution was as follows:

II. — *Percentage of the principal Export Products in 1938 and 1939.*

Product	Per cent.		Product	Per cent.	
	1938	1939		1938	1939
Wheat	6.5	7.3	Sunflower oil	—	0.7
Maize	2.7	—	Medicinal plants	—	0.4
Soya beans	—	1.5	Waste products from oilseeds		
Bran	—	0.3	and oilcake	1.7	1.2
Grapes	10.0	7.6	Cattle	0.7	0.3
Wine	—	3.6	Live pigs	2.2	1.3
Plums	0.9	—	Pig meat	1.5	—
Cooked plums	2.3	2.0	Killed poultry	2.0	1.1
Plum jam	—	0.5	Eggs	7.8	8.4
Apples	1.1	1.7	Kachkaval	1.0	—
Walnuts	—	0.7	Offal	—	0.6
Strawberry pulp	1.5	2.3	Sheepskins	1.4	1.4
Semi-preserved fruits	—	3.9	Tanned hides	—	0.9
Tobacco	42.3	41.0	Charcoal	—	0.6
Attar of roses	1.0	1.2	Leather bottles	1.1	—
Sunflower seed	—	1.4	Miscellaneous	12.3	—

It will be observed that tobacco always heads the list, while fruit and vegetables, as a result of the increase in exports of grapes, now come second.

In 1939 the third place was held by eggs, exports of which are again increasing, while in 1938 cereals took third place, falling in 1939, however, to fourth.

Tobacco is now one of the most important products, perhaps even the most important for Bulgarian agriculture, and special attention is given to the development of exports of this product.

Annual exports amount to between 20,000 and 25,000 metric tons and reached a peak in 1929 and 1939. Since 1934 they have again been increasing and the following table shows Bulgarian tobacco exports for the past four years:

Year	Quantity (Metric tons)	Value (Thousand levass)
1936	20,011	1,263,311
1937	22,098	1,609,721
1938	33,552	2,363,933
1939	34,761	2,786,411

About 70 per cent. of these exports go to Germany, which purchases the inferior qualities; in 1930 large quantities were shipped to Poland, France, Czechoslovakia, Italy, Belgium, Hungary and Egypt, but these countries have now almost ceased to purchase Bulgarian tobacco. The United States are beginning to import large quantities, but this does not by itself suffice to replace the lost markets and new ones must be sought.

Cereal exports depend upon the crop. When there is a good harvest such as in 1936, wheat is the second item on the export list, but in 1938 fruit and vegetables came second owing to the large quantities of grapes shipped

abroad. During the 1907-1914 period fruit and vegetables were very low on the list, the percentage being only 1.9 per cent. as against 20.7 per cent. in 1939. The following table shows grape exports between 1936 and 1938:

Year	Quantity (Metric tons)	Value (Thousand levas)
1936	23,159	190,931
1937	35,991	238,324
1938	57,238	554,323

In 1939 they show a decline in comparison with the record of the preceding year, touching the figure, nevertheless, of 467 million levas.

Exports of other fruits, such as strawberries, apricots, apples, plums, etc., have increased. Here again, Germany is the best customer, purchasing from 70 to 75 per cent. of the exports.

Eggs, which come third on the list, have always been shipped in large quantities. The maximum was reached in 1930, during which year Bulgaria exported eggs to the value of 880 million levas. This item has fallen off since then and is now stabilised between 400 and 450 million levas. In 1939 exports of eggs rose to 512 million levas. There is no cold storage plant in Bulgaria which makes it impossible to export during the winter when prices are at their maximum. Germany again provides the best market, purchasing about 75 per cent. of Bulgarian egg exports. Although exports of killed poultry are of fairly recent date they have come to take an important place, amounting to between 120 and 150 million levas. Germany and Italy are the most important markets for this product.

Wheat comes fourth and is steadily losing ground; maize, which had been fifth item on the list, was not exported at all in 1939, though this was only a passing phenomenon. These two products are, however, still important as they are exported to countries with free exchange. Until 1932 Bulgaria exported large quantities of maize; since then shipments have fallen off and amount to about 150 million levas annually, but this product is sold on the most important European markets (the United Kingdom, Belgium and the Netherlands), and is paid in free exchange currency.

Exports of other fruits and vegetables, fresh and dried plums (prunes), half-preserved strawberries (pulp), apples, tomatoes, walnuts, half-preserved grapes (pulp) reached a value of more than 650 million levas as against 370 million in 1938; and it is hoped that this figures will increase further. Most of these exports are sent to Germany, except the strawberry pulp which is marketed in the United Kingdom. These exports show that the Bulgarian peasant is directing his attention towards the cultivation of the most profitable products.

Exports of pigs, pig meat and lard have been growing more important since 1935. In 1936 141 million levas of these goods were shipped abroad, or six times as much as in 1935; in 1937 the value exceeded 180 million levas, rising to 250 million in 1938; but there was a big fall in 1939, exports amounting to only 105 million levas. It is to be hoped that Bulgaria will not lose her market for this important export product, and that the fall was due simply to the export difficulties which arose in the second half of 1939. Most of these products are purchased by Germany.

The fourth item on the Bulgarian export list in 1936 was sunflower seeds and waste products from oilseeds (oilcake) to the value of 265 million levas. As exports of sunflower seeds fell off sharply in 1938, this category lost considerable ground, shipments amounting to only 136 million levas; but in 1939 they recovered somewhat, exceeding 200 million levas. It is to be hoped that this figure will increase further, as Bulgaria presents all the conditions necessary to become an important sunflower producing country. Exports go to Germany, the United Kingdom, the Netherlands and the northern countries.

Exports of attar of roses have lost much of their importance owing to the use of synthetic products.

Hides are an important item in Bulgarian trade which tend to remain stable: the value of exports, which are purchased mostly by Germany, varied from 100 to 150 million levas.

Exports of dried beans have been increasing steadily during the past years, 120 million levas worth being shipped in 1937; in 1938 and 1939 there was a heavy drop in exports which fell below 20 million levas, but this should be looked on as a passing phase arising from the trade cycle. Germany again ranks first as a customer for this class of produce, followed by France and Italy.

As a result of the world crisis cocoon exports fell off very seriously and have never recovered. Livestock exports have never been of much importance in Bulgaria as there are not sufficient animals. Exports of *kachkaval* ⁽¹⁾, although not very important, are regular and vary from 50 to 70 million levas; most of the exports of this product are sold in Egypt.

In 1939 a new item appeared among Bulgaria's export goods, and at once occupied one of the leading places. This was wine, exports of which had up till then been negligible, but which seem to have very good possibilities. If the output of wine of types with a market abroad can be increased, the product might assume great importance as an export commodity, for Bulgaria produces annually more than 250 million litres of wine, of which at present only a very small quantity is exported.

Since the fall of the leva during the World War and as a result of the increasing difficulties in currency exchange, Bulgarian foreign trade has been directed mainly towards Central European and Italian markets and latterly towards the United Kingdom. There is a tendency to send some Bulgarian exports to the Levant, where marketing conditions are good and will improve as time goes on; moreover, these markets present the advantage of payments in free exchange currency. The quota system forced Bulgaria to direct her foreign trade to controlled markets where free exchange currency was not available, and now in order to procure it she is trying to place her exports on the markets in Egypt, Palestine, the Netherlands, and the northern countries, but above all an attempt is being made to recover her former position in the British market.

(1) Cheese made from ewe's milk.

In the first few years after the Great War, Italy, the United States and Turkey were the main sources of Bulgarian imports. In 1922 Germany came forward as the largest source of supply as well as one of the best foreign markets. From 1922 to 1929 she supplied about 22 per cent. of Bulgarian imports, and this percentage has been rising steadily ever since 1929.

The Greek and Belgian markets which used to receive large quantities of Bulgarian goods have been losing ground gradually, while the British market has increased in importance until it now occupies the second place, coming next to Germany. The share of the Danubian Basin in Bulgarian foreign trade fluctuates considerably, but from 1922 to 1931 this region supplied Bulgaria with most of the articles she required.

The share of the various countries in imports has undergone many changes. The Danubian Basin was Bulgaria's largest supplier from 1922 to 1931, but was replaced during and after the economic crisis by Germany whose share has increased steadily and now exceeds 50 per cent. of the total value of imports.

On the other hand, the world depression caused little change in the share of the various countries in exports, although a large number of countries have been able to increase their purchases from Bulgaria. In spite of the fact that Germany has rapidly increased her purchases of Bulgarian products, Bulgaria still buys more than she sells to Germany.

This development is clearly demonstrated in the following table which shows the share of the different countries in Bulgarian imports and exports during the periods 1925-1929, 1930-1934 and 1935-1937.

Shares of certain Countries in Bulgarian Foreign Trade.

(Percentage of total value)

	Imports			Exports		
	1925 29	1930 34	1935 37	1925 29	1930 34	1935 37
Germany	21.2	27.8	50.2	24.2	30.4	45.0
Austria	8.4	6.4	4.0	11.9	11.4	3.8
Italy	13.0	13.1	3.2	10.8	8.5	5.2
United Kingdom	10.8	9.5	4.7	1.2	1.8	10.6
France	7.6	6.7	2.2	5.5	3.8	1.7
Belgium and Luxemburg	3.2	4.5	2.7	4.3	6.0	2.2
Netherlands	2.5	2.1	1.2	3.5	3.3	2.1
United States	2.4	1.8	1.9	1.4	0.0	2.7
Switzerland	2.2	4.2	3.1	3.7	5.1	2.4
Poland	0.4	2.2	3.1	3.9	6.6	3.7
Czechoslovakia	0.6	7.8	7.0	5.1	4.6	5.2
Romania	6.0	5.2	3.0	0.9	0.4	0.2
Turkey	2.4	1.8	0.6	3.2	1.3	0.6
Yugoslavia	1.7	0.6	0.4	0.2	0.2	0.6
Greece	1.4	0.0	0.4	12.1	1.9	0.6
Other countries	6.3	5.4	5.4	8.0	12.0	12.5
Total	100	100	100	100	100	100

After 1931, as a result of currency control and the conclusion of clearing agreements, two groups of countries come to be distinguished those with clearing agreements and those with free exchange currency. A study of the following table will show the large increase in exports to Germany and also towards the countries with free exchange currency.

*Bulgarian Foreign Trade with Clearing Agreement Countries
and with Countries with Free Exchange Currency*

Country	Imports as percentage of total imports				Exports as percentage of total exports			
	1927 1929	1930 1932	1933 1935	1936 1938	1927 1929	1930 1932	1933 1935	1936 1938
<i>I — Countries with clearing agreements</i>								
Austria	8.0	6.7	5.8	4.6	14.4	13.2	6.5	3.5
Belgium	3.2	2.5	3.8	2.2	4.6	7.5	4.3	2.0
Spain	0.1	0.2	1.3	0.1	0.1	0.1	3.2	0.4
Italy	13.5	14.3	7.9	4.4	9.6	8.9	9.0	5.0
Poland	0.5	2.4	1.5	4.3	4.6	7.9	1.8	4.7
Turkey	2.4	1.1	1.1	0.7	3.3	1.4	0.9	0.6
Hungary	2.4	1.8	1.2	1.8	3.0	2.5	1.3	1.1
France	7.7	7.6	3.2	2.7	5.5	3.9	2.4	1.7
Netherlands	2.5	2.4	1.3	1.1	3.0	3.5	2.6	2.2
Czechoslovakia	9.9	9.1	6.1	6.2	4.1	4.7	4.7	4.5
Switzerland	2.3	3.6	6.1	2.1	2.2	5.3	4.3	2.1
Yugoslavia	0.5	0.7	0.4	0.4	0.3	0.3	0.3	0.5
All countries except								
Germany	53.0	53.4	39.7	30.8	54.7	59.2	41.3	28.4
Germany	21.5	21.1	43.9	55.9	26.9	27.2	42.2	49.8
<i>II — Countries with free currency exchange</i>								
United Kingdom	10.4	10.6	6.0	5.1	1.5	1.9	2.7	9.9
Denmark	0.3	0.1	0.0	0.1	0.0	0.6	1.8	2.4
Egypt	0.7	0.2	0.5	0.5	1.5	2.4	3.2	2.0
Norway	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1
Palestine	0.0	0.1	0.1	0.3	0.4	0.7	1.7	1.0
United States	2.4	1.1	1.9	2.3	1.3	0.9	0.9	3.3
Sweden	0.8	0.5	0.5	0.8	0.1	0.4	0.5	1.5
Total	14.7	12.7	9.0	9.4	4.8	6.9	10.9	20.2

Since 1922 Germany has been the largest supplier of Bulgaria and since 1924 she has also become her most important customer but it is especially since 1930 that German participation in Bulgarian trade has been increasing without interruption. In 1937 Germany purchased 43.1 per cent of Bulgarian exports,

followed by the United Kingdom (13.8 per cent.), Czechoslovakia (5.6 per cent.), Poland (4.6 per cent.), Italy (4.2 per cent.), Austria (4.1 per cent.), the United States (3.8 per cent.) and other countries with smaller percentages amounting to 20.8 per cent. In 1938, as the result of the annexation of Austria and the increased demand for agricultural produce, the importance of the German market increased still further, Germany taking as much as 58.9 per cent. of Bulgaria's total exports. Italy came second, absorbing 7.6 per cent., and thus recovering the position she had held from after the Great War until the sanctions period. The third place was occupied by Poland with 5.7 per cent. and the United Kingdom came fourth with 4.8 per cent.

Germany also heads the list as Bulgaria's chief source of imports; in 1937 she came first with a larger amount of imports than of exports, German products representing 54.8 per cent. of Bulgaria's total imports. Italy and Czechoslovakia came next with 5.0 per cent. each.

Bulgarian export trends altered considerably in 1938, although imports remained stationary. Germany continued to head the list of importers, but with a lower percentage in spite of the annexation of Austria. Imports from Germany represented 52.0 per cent. of total imports and Bulgaria's trade balance with Germany closed with a surplus of 721 million levas compared with the 1937 deficit of 537 million. Italy again came second, providing 7.5 per cent. of Bulgaria's imports, and the United Kingdom third with 7.1 per cent.

Bulgaria is therefore trying to reduce imports from Germany and to increase her exports to that country, in order to adjust the balance of trade, the results of this policy are already noticeable.

There has been general recovery in Bulgaria since 1935 and progress was hardly affected by the difficult world economic conditions during the latter part of 1937. The sharp fall which took place in the prices of raw materials in the autumn of 1937 was not reflected in the Bulgarian wholesale price index, which continued to rise.

The development of trade relations with Germany increased economic activity. As a result of measures taken to avoid a fresh crisis following on the bad harvest in 1938, the year 1939 finished for Bulgaria with a fairly large surplus and a 10 per cent. increase in exports, imports remaining about the same. The good harvest in 1939 and the big demand for agricultural produce led to big exports, and as these involved no increase in imports, Bulgaria was able to conclude with an active balance of trade of 868 million levas. It is to be hoped that the many difficulties caused by the war in the West will not prevent Bulgaria from developing her trade, which in 1936 nearly reached the volume attained in what may be considered the normal year of 1930.

K. POMENOW.

INTERNATIONAL CHRONICLE OF AGRICULTURE

GERMANY

Measures relating to agricultural production.

Land improvements — Land improvement occupies a very prominent place among the measures taken in recent years for the increasing of agricultural production. Measures of land improvement, whether in the form of the regulation of water courses, the cultivation of what was formerly waste land, or the winning of new land from sea and swamps, have been undertaken on a scale never before witnessed. In the six-year period 1933-1938 ⁽¹⁾ 1,169 million RM. were spent on such works and about 2 million hectares of land improved—for example ⁽²⁾, 15,463 kilometres of river affecting an area of 700,000 hectares and 328 kilometres of torrents were rechannelled; 254,050 hectares were diked; 650,885 hectares were drained by means of open ditches and 341,911 hectares by drainage operations; on 29,904 hectares irrigation plants were set up, mostly in connection with the utilization of sewage water; 103,129 hectares of waste land were brought under cultivation, without considering the waste land reclaimed by existing agricultural undertakings; 20,864 hectares were reclaimed along the coasts; 20,583 kilometres of rural roads were constructed; and over 2,000,000 rural inhabitants were provided with drinking water. Of the above-mentioned total costs 96,829,000 RM. were devoted to the construction of dams, the benefits of which will, however, only in part accrue to agriculture. In these figures are included only those works which were carried out by or with the aid of the State authorities, and hence no account is taken of the small improvements undertaken by the individual farmers themselves.

These improvements were carried out with the aid of the Reich, the *Länder*, the provinces and the Reich Office for Employment and Unemployment Insurance (*Reichsanstalt für Arbeitsvermittlung und Arbeitslosenversicherung*). Thus the total costs during the six-year period 1933-1938 amounted to 1,169 million RM., of which 316 million were contributed by the Reich, the *Länder*, the provinces etc., 253 million RM. were provided in the form of subsidies by the *Reichsanstalt*, the remaining 600 million RM. being covered by the beneficiaries themselves or through loans. The central body for the necessary credits is the *Rentenbankkreditanstalt*, which employed its own and others' resources for the purpose. The outstanding credits for the effecting of improvements granted by this institution amounted at the end of 1938 to about 600 million RM.

In carrying out the improvements extensive use was made of the labour service corps (*Reichsarbeitsdienst*), without the aid of which the results achieved would have been impossible and many of the works could not have been carried out as the necessary costs would have been excessive.

⁽¹⁾ The figures for 1938 include the former Austria.

⁽²⁾ *Die Meliorationen in den Jahren 1933 bis 1936*, published by the Reich Ministry for Food Supply and Agriculture, Berlin, 1938. *Gefüge und Ordnung der deutschen Landwirtschaft*, a collective work edited by K. MEYER, Berlin, 1939 — WILLIKENS, WERNER: *Die Ergebnisse des Landeskulturwerkes in den Jahren 1937 und 1938*, *Der Vierjahresplan*, December 1939.

Consolidation of parcelled lands: — The Reich Order on the Consolidation of Holdings of June 16, 1937, which entered into force on January 1, 1938, created a unified procedure for the consolidation of holdings within the Reich territories of that date. This order replaced more than 50 legislations, many of them antiquated, of the various *Länder* and was intended to make the consolidation process simpler and speedier. The aim of the consolidation of holdings remains the same as before, namely to decrease the number of parcels of land in areas where holdings are excessively scattered or otherwise unsuitably divided and to give them a form more suitable for their profitable working. In addition it is intended to create the road net-work necessary for an intensive exploitation and to regulate and adjust the water conditions, the rights of pasture and similar rights and duties, in order in this way to create the best possible conditions in the countryside for an intensive working of the available land. Often a re-allocation also proved necessary where the countryside was cut through by new railway lines, great trunk roads, canals or dikes in such a way as to render certain existing holdings uneconomic. Wherever possible, desirable land improvements were also effected simultaneously with the re-allocation or consolidation of holdings. The total area of land holdings which were excessively divided and in need of consolidation was estimated to run into several millions of hectares.

In the period 1933-1938 about 600,000 hectares in all were consolidated. Since 1937 detailed statistics have been kept which show that in 1937 105,000 hectares were consolidated and in 1938 125,000 hectares ⁽¹⁾. The number of consolidations in the different parts of the country corresponded to the degree to which landed property was scattered in them, most of the consolidations having thus taken place in those parts of West and South-west Germany where it was formerly the custom to divide real property among the heirs.

Land system.

Distribution of agricultural and forest properties: In Germany, as indeed in almost all countries, there was until recently very little information available on conditions regarding the ownership of agricultural and forest lands. Since 1882 agricultural censuses have been taken at regular intervals, but these confined themselves in this respect to ascertaining the legal relationship of the head of the undertaking to the land he worked. From statistics gathered in this way it could, for example, be seen that in 1933 of the total area occupied by agricultural or forest undertakings 88.7 per cent. was worked by the owner, 10.7 per cent. by tenants and 0.6 per cent. by farm-workers partly paid in kind or others. Valuable as these figures are, they tell us nothing about the proportions in which properties of different size groups combine to cover the total area, nor of the shares of the total possessed by different classes of owners. In order to fill up gaps of this sort the first efforts were made in 1937 to provide detailed statistics of every type concerning the ownership of lands and forests, and recently the first results of this enquiry were published ⁽²⁾.

⁽¹⁾ Die Umlegungen landwirtschaftlichen Grundbesitzes 1937 und 1938. *Vierteljahrshefte zur Statistik des Deutschen Reiches*, 48th. year, 1939, No. 2 — WILLIKENS, WERNER, *op. cit.*

⁽²⁾ Die Eigentümer der land- und forstwirtschaftlichen Bodenfläche. *Wirtschaft und Statistik*, 19th. year, No. 23, December 1, 1939.

Distribution of Agricultural and Forest Properties in Germany (1937)

Class of owner	Total area of agricultural and forest property		Area used for agriculture (including market gardening and vine growing)		Area used for forestry		Waste land, lakes and ponds	
	Thousand hectares	Per cent	Thousand hectares	Per cent	Thousand hectares	Per cent	Thousand hectares	Per cent
1 Reich and <i>Länder</i>	5 616.5	12.7	1 011.5	3.3	4 311.1	34.0	294.0	31.3
2 Communes	3 061.3	6.9	1 021.0	3.4	1 896.1	15.0	144.2	15.4
3 Churches, religious institutions, religious endowments	703.5	1.6	577.5	1.9	115.2	0.9	7.8	0.8
4 Non-religious institutions and foundations	172.2	0.4	83.8	0.3	54.5	0.7	3.9	0.4
5 Schools and school unions	74.8	0.2	63.9	0.2	10.0	0.1	0.9	0.1
6 Colonization companies	172.6	0.4	145.5	0.5	23.4	0.2	3.6	0.4
7 Other public bodies	137.1	0.3	70.6	0.3	49.1	0.4	11.5	1.2
8 Co-operatives of every sort	80.1	0.2	30.6	0.1	46.5	0.4	3.0	0.3
9 Real communities (<i>Realgemeinde</i>)	279.2	0.7	70.4	0.2	197.2	1.6	11.6	1.2
10 <i>Fideicommiss</i>	847.7	1.9	312.1	1.0	493.9	3.9	34.7	3.7
11 Companies	446.2	1.0	270.7	0.9	152.4	1.2	23.1	2.5
12 Other societies and associations	45.2	0.1	21.9	0.1	10.2	0.2	4.1	0.4
13 Joint owners of every sort	1 585.7	3.6	1 133.8	4.0	330.3	2.7	35.5	3.8
14 Private persons with under 20 hectares . . .	13 639.5	30.9	12 481.7	40.9	1 092.3	8.6	65.5	7.0
15 Private persons with 20 hectares or over	17 270.1	39.1	13 110.1	43.0	3 555.2	30.4	295.7	31.5
TOTAL	44 124.5	100.0	30 500.1	100.0	12 685.3	100.0	939.1	100.0

The enquiry was conducted on the basis of the standard value forms ⁽¹⁾ available for all undertakings of whatever sort. In making use of these forms all agricultural and forest land belonging to one and the same owner within the territory of the Reich was grouped together to form one property unit, quite irrespective of whether it was worked separately or jointly, by the owner or by a tenant. Then the properties were classified according to the different classes of the owners (the Reich, the communes, the churches, companies, single persons, etc.) the owners being grouped into about 30 different classes, which in the provisional publication have been reduced to 15.

⁽¹⁾ The standard value is the value calculated for the purpose of taxation according to a standard procedure of every agricultural, forest, market-gardening and vine-growing undertaking within the territory of the Reich. Land taxes, property taxes, inheritance taxes and the taxes on the purchase of lands are all based on the standard value.

The enquiry showed the total area of the forest and agricultural landed property to amount to 44,124,510 hectares, composed as follows:

Land used for agriculture	30,355,098 hectares
" " market-gardening	72,239
" " vine-growing	72,739
" " forestry	12,685,321
Lakes and ponds	405,236
Waste	533,877

Of this total area 70 per cent. belonged to private persons (including husband and wife with their total possessions), 30.9 per cent. belonging to such persons with less than 20 hectares each and 39.1 per cent. to those with 20 hectares or over each. The landed property of private persons is mainly in the form of land used for an agricultural purpose, for whereas their share of the land used for forestry is only 39.0 per cent. they have 83.9 per cent. of the land used for agricultural purposes.

The 10.6 per cent. of the total area belonging to the Reich, the *Länder* and the communes consists mainly of areas used for forestry, for their ownership covers 49.0 per cent. of the total area used for forestry and 46.7 per cent. of the wastes, lakes and ponds.

The share of the total property owned by private persons will in future be increased by the greater part of the area still under *fideicommiss* in 1937, as the Reich law of July 6, 1938 ⁽¹⁾ ordered the abolition of *fideicommiss*. 59 per cent. of the area under *fideicommiss* consisted of forest.

The properties jointly owned by several persons consist mainly to the extent of 76.5 per cent. of small plots used predominantly for agricultural purposes.

The next most important group of owners are the religious bodies which have 703,516 hectares, or 1.6 per cent. of the total area. Of this area 83 per cent. consists of lands used for agricultural purposes, mostly in the form of numerous plots let out to small farmers.

The above figures it should be remembered are the figures for the whole territory of the Reich, whereas if the various regions were considered separately the resulting percentage would in some cases differ considerably from the general percentage for the whole Reich. Such differences would be especially marked as regards the lands owned by the State and by private persons for example, the share of the total land owned by private individuals is well above the general Reich percentage in those parts of the country where peasant agriculture predominates. But the material as yet published is in general insufficient to allow of the drawing of any far-reaching conclusions.

Peasant settlement: — The creation of new peasant farms as part of the policy of internal colonization has been continued in recent years, although admittedly on a declining scale. Owing to the improved conditions in agriculture the number of farms for sale has shown a great decrease and the prices of land have risen, so that it has become more difficult to acquire land for settlement purposes.

In 1938 ⁽²⁾ 1,456 new farms covering 27,834 hectares were occupied by settlers, as against 1,894 farms covering 37,596 hectares in 1937, 3,308 farms covering 60,358

⁽¹⁾ See the Chronicle on Germany in the October 1938 number of this *Bulletin*.

⁽²⁾ *Die Bauernsiedlung im Jahre 1938. Vierteljahresshefte zur Statistik des Deutschen Reichs* 18th. year, 1939, No 3, Berlin, 1939.

hectares in 1936, 3,905 farms covering 68,338 hectares in 1935 and 4,931 farms covering 74,192 hectares in 1934. In the twenty-year period 1916-1938 altogether 77,865 new farms with an area of 930,725 hectares were constituted. The newly settled peasants together with their families, but excluding paid labourers employed, amounted to 6,733 persons in 1938, bringing the total number of peasants together with their families settled in the six-year period 1933-1938 up to 88,776.

The average size of the peasant farms newly settled in 1938 amounted to about 19.1 hectares. This was a little lower than the corresponding figure for 1937—19.9 hectares—but considerably above the 10.5 hectares average for the period 1910-1932. The creation of non-independent farms has been kept at a minimum in recent years; for the new farms are to be of sufficient size to make possible the use of the latest methods. In 1938 78.4 per cent. of the new farms were 10 hectares or over in size as against only 13.1 per cent. less than 5 hectares in size, whereas farms under 5 hectares constituted 8.5 per cent. of the total in 1937, 11.5 per cent. in 1936, and 40.6 per cent. in the period 1910-1932.

In addition to the creation of new farms small farms have also been increased in size, this constituting the second part of the settlement policy. In 1938 7,818 small farms were increased by 16,950 hectares. But whereas the newly created peasant farms were created exclusively on the basis of ownership the increases made in the size of already existing farms have partly been on a tenancy basis. The average increase in size amounted to 2.2 hectares per farm. In 1937 10,800 small farms had been increased by 21,400 hectares.

Further areas were acquired by the land-settlement companies in 1938 for the continuance of their activities. On January 1, 1939 the settlement companies had about 103,000 hectares—including 6,110 hectares in Austria—at their disposal, as against 101,000 hectares (excluding Austria) at the beginning of the two previous years.

The average book-price of the lands acquired for settlement in 1938 amounted to 1,457 RM. per hectare, as against 1,111 RM. in 1937, 991 RM. in 1936, 643 RM. in 1932 and 992 RM. in 1929. The causes of this rise in the prices paid for land we have already indicated.

H. BÖKER.

NETHERLANDS INDIES

The Netherlands Indies are mainly occupied in agriculture and mining, and their principal products accordingly are raw materials for industry such as rubber, palm oil, tin, petroleum and foodstuffs such as rice, maize, soya beans, coffee and tea.

The agricultural element certainly predominates, and in considering it a distinction must be made between Java on the one hand and the outer possessions of Sumatra, Borneo, etc., on the other.

Java is very thickly populated and produces chiefly foodstuffs by far the greater part of which are consumed within the country. The chief of these foodstuffs is rice. Since 1933 rice prices in the home market have been made independent of those in the world market and have been practically stabilized. Consequently, when the new world recession began in 1937, continuing during the agricultural year 1938-39 and up to the outbreak of war in Europe, the population of Java was only slightly affected by the crisis. It felt the effect only in so far as it was employed in the cultivation of sugar, rubber, tea and cinchona, which are greatly dependent

on the world market and were seriously affected by the depression. These crops, however, although not without significance particularly for the foreign capital invested in them, are of relatively small importance for the population of Java.

The position in the outer possessions was quite different. These areas depend for the most part on export goods for the world market such as rubber, tea, coffee, copra, palm oil. They were therefore greatly affected by the depression which began in 1937 and continued till August 1939. But since September 1939 the position has improved greatly, quantities exported and prices both rising.

As soon as war broke out the demand on the international market for the majority of the Netherlands Indies export goods increased rapidly. As productive capacity was—and still is—greater than consumption, the effect of the war was in the first place to produce an increase in the quantities exported, and in the second place a moderate rise in prices. For coffee, however, the position was aggravated by the plentiful supply of Brazilian coffee, so that prices, which had been low before the war, have not since recovered. The prices of copra and pepper experienced a temporary decline in September 1939 owing to the difficulties of sea transport, but they have since recovered.

In 1938-39 and up to the outbreak of the war the general index of prices of export products remained practically stationary, for while the prices of the principal mineral and vegetable export products, such as tin, rubber, and sugar rose, those of various other agricultural products fell to some extent. Since the war they have almost all increased.

Rubber prices increased greatly, from 22 cents per half kilogramme in May 1938 to 32.5 cents in August 1939, while by October 1939 they had reached 35 cents. The increase which took place before the war was undoubtedly due to military preparations.

Sugar prices also improved greatly. From 5.37 florins per 100 kilogrammes they rose to 7.16 florins in August 1939 as a result of the bad harvests in Europe and British India. Since the war prices have increased again, the supplies of sugar from Central Europe and England having decreased owing to the war and being replaced by Java sugar.

Tapioca prices have been at a not very remunerative level, although they were rising at the time of the outbreak of the war. They fell first, from 4.86 florins per 100 kilogrammes in May 1938 to 4.40 florins in September and then rose slightly, to 4.90 florins at the end of the year. This very low level was caused by the reduction in the requirements of the starch factories in Europe and America as a result of good crops in those parts of the world. In 1939, however, prices rose to 7.16 florins in August owing to the increasing international tension and the less favourable prospects for the wheat and maize crops in America. Since the beginning of the war prices have risen steeply, and parallel with those of wheat and maize.

The trend of the prices of vegetable fats and oils such as copra and palm oil was discouraging during 1938-39. The prices of copra in Java fell from 6.70 florins per 100 kilogrammes in May 1938 to 5.18 florins in November 1938, but then recovered to 6.55 florins in June 1939, after which they again declined. In September 1939 the war produced a sudden drop to 5 florins, but prices then rose again to about 6.50 florins. Despite the low prices of palm oil in recent years exports have increased enormously, rising from 36,000 metric tons in 1929 to 227,000 metric tons in 1938. Exports of copra were 457,000 metric tons in 1929 and reached 553,000 metric tons in 1938.

The trend of coffee prices has also in general been unsatisfactory since the autumn of 1937 when the Brazilian government changed its policy from one of destroying

surplus supplies of coffee to one of encouraging exports of this commodity. Thus the price of Java coffee, which was 18.97 florins per 100 kilogrammes in May 1938 fell to 17.37 florins in August 1939. The war has not had much effect on this price.

Up to the war tea prices remained steady at about 40 cents per half kilogramme. They have since risen.

The prices of capok were stabilized by the government for 1938-39 at 44.5 florins per 100 kilogrammes. Since September 1939 the presence of unmarketable stocks led the government to modify its policy of stabilization, and a minimum price of 25 florins was fixed while the actual level reached was 28.75 florins.

External trade.

The external trade policy, which for several years had been on a reciprocity basis, was not changed during 1938-39. Several new agreements were concluded whereby the Netherlands Indies granted import quotas to foreign countries in exchange for import quotas from these countries for Netherlands Indies produce. A whole series of these agreements now exists between the Netherlands Indies and other countries, and by them many foreign markets have been kept open for the export products of the Netherlands Indies.

In addition clearing agreements were concluded with certain foreign countries which were unable to pay for goods from the Netherlands Indies in foreign currency. The agreement with Germany continued in force. This agreement is of great importance for the Netherlands Indies since several of their products find a good market in the Reich. The agreement with Romania was also renewed in 1938-39.

The need for strengthening trade relations with the mother country on the one hand, and restoring or maintaining equilibrium in the trade balance with foreign countries on the other, led to extensive regulation of imports in favour of the Netherlands. The consequence of this policy has been an increase in imports of Dutch goods into the Netherlands Indies from 39 million florins in 1933 to 94 million in 1938 and of imports of Netherlands Indies goods into the mother-land from 51 million florins in 1933 to 102 million florins in 1938.

The trade balance with Japan, which had become very adverse for the Netherlands Indies, and threatened to become increasingly so, was stabilized and greatly reduced. Whereas in 1933 it amounted to 75.5 million florins, by 1938 it had fallen to 50 million florins.

For certain goods import licences have been introduced. The customs tariffs have always been of a fiscal, and not a protectionist nature. Furthermore they were reduced when the Netherlands Indies florin was depreciated in September 1936 to prevent too rapid a rise in internal prices. After the recession had begun in 1937 the prices of imported goods fell to such an extent that the reduction in the customs tariff ceased to be necessary, and on January 1, 1939 most of the original duties and supplementary charges were restored.

Although the large agricultural concerns and the exporters have their own relations with foreign markets, there is a great need for giving more publicity to Netherlands Indies products and for finding new markets. The government has therefore set up in various foreign towns - notably Durban, Sydney, New York, Alexandria and Buenos Ayres - *handelswaarnemer* stations, that is commercial representatives with the task of pushing sales of Netherlands Indies produce. In other foreign countries the Dutch Legations also look after the commercial interests of the Netherlands Indies. The Netherlands Indies government has in addition appointed some trade representatives with similar functions in the mother country, one of them being in the Colonial Ministry at the Hague.

Measures relating to the marketing of agricultural products.

The government is also making efforts to stimulate the sale of agricultural products on the internal market. For this purpose it has organized a group of officials to search for new outlets for native products within the Netherlands Indies themselves and to establish as close a contact as possible between producers and markets.

The government's policy of fixing the price of rice, initiated in 1933, and of which a review will be found in *The World Agricultural Situation in 1936-37 and 1937-38*, was continued. As a result of this policy the price of rice did not change greatly in 1938-39 and remained independent of prices on the international market.

The protective policy for soya bean prices was also continued and has led to a great expansion in Java's output of this product, the area under soya beans having risen from about 238,000 hectares, in 1933 to 378,000 hectares in 1938.

Price policy as regards exports mostly takes the form of a restriction of output or exports, by which means it is hoped to stabilize as far as possible the prices of various export products. This relative stabilization has been achieved for rubber, tea, cinchona and sugar. More will be said of this below.

Only in the case of one good—capok—has the policy of price stabilization been applied without any restriction on output or exports. As Java enjoys almost a world monopoly of capok the government fixed export prices, in agreement with those concerned, at a relatively high level. Since the beginning of the recession a minimum export price of 40 florins per 100 kilogrammes has been in force. It became apparent, however, that this minimum was too high, for the whole output could not be sold at the price. The minimum price was therefore lowered as from September 1 to about 25 florins per 100 kilogrammes.

Measures relating to agricultural production.

The population of the Netherlands Indies is constantly increasing, particularly in Java which already has a serious over-population problem. Since the beginning of the century the authorities have therefore been pursuing a policy of encouraging and improving the native production of foodstuffs such as rice, maize, soyabeans and of export products such as rubber, tea and coffee. The results of this policy have been very satisfactory, so that apart from a few bad crops the output of foodstuffs has been increasing. The 1938 harvest was very good. The output of rice (after deducting rice for seed) reached 3,859,100 metric tons in 1938, as against an average annual output of 3,299,800 metric tons, in the period 1928-37. As a result of this steady increase, output per head has also risen; thus in 1938 it was 88 kilogrammes per head, whereas the average figure during the years 1928-37 was 81 kilogrammes.

By stimulating the production of rice, the government has succeeded in making the country less dependent on foreign sources, although complete self-sufficiency as regards rice has not been achieved. Nevertheless, if we take the output of all food products together—that is, rice, maize, manioc and others—the Netherlands Indies produce sufficient for their own requirements, a fact of some importance in time of war. Even so, however, when war broke out the government thought it necessary to issue an order by which the population could be compelled to cultivate such and such food products, since allowance must be made for the possibility of a bad harvest or the interruption of shipping between the various parts of the Netherlands Indies, which would result in certain regions not being able to obtain sufficient foodstuffs.

In last year's report it was pointed out that for some years the production of certain agricultural products for export—sugar, rubber, tea and cinchona—had been restricted in order to stabilize their prices as far as possible. These restrictions were maintained during 1938-39, in which period the recession had some effect on the prices of these products, the effect being particularly marked in the case of rubber prices. To offset this, the restriction on the output of rubber, which had been fixed at 30 per cent. for the first quarter of 1938, was raised to 40 per cent. for the second quarter, to 45 per cent. for the latter half of 1938 and to 50 per cent. for the first half of 1939. As the situation began to improve, however, this restriction was reduced to 40 per cent. for the second half of 1939. The agreement between the United Kingdom and the United States for the exchange of rubber against cotton led to a further reduction of 10 per cent. in the restriction for the last quarter of 1939. The conditions brought about by the war produced yet another reduction to 25 per cent. for the last quarter of 1939. Thus the export quota is now 75 per cent. of productive capacity.

Restriction on the output of other agricultural products was not so strongly influenced by the depression and the partial recovery during the last months preceding the war. The restriction on tea, for example, was fixed for 1938-39 at 7 1/2 per cent. and for 1939-40 at 10 per cent. After the outbreak of war it was again reduced to 5 per cent., so that the export quota is at present 95 per cent.

Land system.

Internal settlement — For many years the government has been encouraging emigration from Java and Madura, which suffer somewhat from over-population, to other sparsely populated islands. As a result of intensive propaganda, transport facilities, and above all regular communication between the settlers and their relatives and friends remaining in the place of their birth, migration increases steadily. The number of settlers moved per year rose from 2,756 in 1934 to 32,259 in 1938. The government hopes soon to reach the figure of 100,000 new migrants per year.

Work of public and private agricultural organizations.

The government is attempting to improve the quality of several agricultural products, which is sometimes very poor owing to the indifference shown in this respect by the native producers and the traders. Some years ago, therefore, the government set up organizations which were assigned the task of taking the requisite measures to persuade the native population to improve the quality of certain products—capok, essential oils, manioc, resin and tobacco. These measures have already been attended with considerable success.

Agricultural concerns, and particularly foreign ones, producing rubber, tobacco, tea etc. have long been in possession of experimental institutions to discover more productive species of plants, to improve the quality of the products, etc. These institutions continue their work.

Agricultural co-operation.

The government has sought to encourage the activities of the native population, *inter alia* by setting up co-operatives. These co-operative societies, which were authorized by an order in 1927, must be formed and administered by the natives themselves,

the authorities confining themselves to giving advice and exercising a certain amount of supervision. The number of co-operatives is rapidly increasing. During the period 1928-38 612 co-operatives were formed and 72 dissolved, giving a net increase of 540 for the eleven years period; whilst in 1938 alone 144 co-operatives were formed and 14 dissolved, leaving a net increase of 130.

Of the 540 co-operatives existing in 1938, 427 were saving and credit co-operatives, these being simpler to administer than the other types of agricultural co-operatives. In the same year there were also 47 debt redemption co-operatives, 37 producers' co-operatives, 15 consumers' co-operatives and 13 of other types. The total capital of all the co-operatives amounted to 1,182,783 florins. This figure shows that the co-operatives are not very large, but in an eastern country with a relatively poor population they are not without their importance.

Agricultural credit.

The People's Credit Institution, which has been in existence for some thirty years and which aims at supplying farmers, small traders and native manual workers with credit at cheap rates, increased its credits from 1937 to 1938 by nearly 4 million florins. The small native village banks increased their credits by 25 million florins. Arrears of unpaid interest fell by 900,000 and 23,000 florins respectively.

The institutions granting loans on pledges advanced 10 million florins more in 1938 than in 1937—a fact which for an eastern country indicates an increase in the well-being of the native population. Indeed, repayments in 1938 increased by 10.4 millions, thus running parallel with the new loans.

As pointed out above the government has also sought to stimulate credit and savings through savings and credit co-operatives.

As regards the regulation of indebtedness in agriculture, the government has since 1935 taken various measures to reduce the land indebtedness of the native population. Many debts have been bought up by the People's Credit Institution, the purchase being guaranteed by a fund of 600,000 florins set aside by the government. The People's Credit Institution attends to the repayment of the debts, which is done in such a way that the natives are gradually freed from their debts. To prevent them from again running into debt several debt redemption co-operatives were formed. The lands affected were taken as security and the co-operatives take over the sale of their members' produce. In 1938 there were 47 such co-operatives.

Farm labour.

Agricultural wages are the object of continued government attention. In Java efforts are constantly being made to persuade the owners of agricultural concerns to pay the workers wages sufficient for subsistence. At present household budgets of coolies are being collected in seventy different parts of Java so that the wage level may be examined as closely as possible.

In the islands outside Java the wages of workers in both Dutch and foreign concerns have long been under government control and are sufficient.

ITALY

In its present phase Italian agriculture is directed towards the fullest exploitation of national resources in order to increase production and so cover the growing internal requirements and also intensify exports

To achieve this increase in production it was necessary to calculate the precise costs of production and then to take steps to assure farmers of remunerative and stable prices. In agriculture this was done by the system of "pools" (*ammassi*), that is by organizing the collective sale of products. So far the system has been applied to wheat, maize, rough rice, bran, olive oil, cocoons, hemp, wool, cotton, essence of bergamot, saffron and manna. In the case of other products for which pools did not seem technically possible, provision was made for maintaining prices indirectly by the regulation of sales, deferring them until the most suitable moment. Store places and factories have therefore been erected for the storing and processing of products.

The present international situation has also led the government to regulate the distribution and consumption of certain goods, such as meat, coffee and sugar

*Index Numbers of Wholesale Prices of Raw Materials
and Manufactured Goods*

(1928 = 100)

Year and month	Raw materials			Manufactured goods	
	of vegetable origin ⁽¹⁾	of animal origin ⁽²⁾	Goods other than foodstuffs, mainly of animal and vegetable origin ⁽³⁾	Foodstuffs of vegetable origin ⁽⁴⁾	of animal origin ⁽⁵⁾
1934 .	57.9	55.0	54.9	67.2	53.9
1935 . .	69.4	57.8	58.3	75.1	58.6
1936 . .	78.3	70.3	70.5	74.9	66.1
1937 .	87.4	88.5	87.8	84.1	80.0
1938 .	90.5	86.6	100.4	95.1	85.0
January 1939	92.7	88.5	104.5	97.2	87.3
February "	93.9	86.5	104.4	96.9	87.8
March "	95.8	85.9	104.4	96.6	87.6
April "	96.1	87.3	104.3	96.4	88.6
May "	93.4	87.3	104.3	96.3	88.1
June "	97.0	87.3	104.3	96.2	88.0
July "	91.5	88.4	104.5	95.9	88.0

(¹) i. e. I. for industrial use: cotton, hemp, flax, sea-wrack, firewood; II for food purposes: (a) for the food industries: wheat, maize, rough rice, rye, barley, cacao, bran, oats, hay, (b) for direct food purposes: beans, potatoes, onions, kidney beans, fresh fruits, dried fruits, citrous fruits, and raw coffee. —

(²) i. e. I. for industrial purposes: silkworm cocoons, wool, horsehair, fresh hides, foreign dried hides; II. for food purposes: bullocks, cows, calves, pigs, sheep, poultry, eggs, fresh sea fish, chilled meat, milk. — (³) i. e. materials of silk, cotton, wool, hemp, shoes, hats, paper, soap. — (⁴) i. e. rice, olive oil, refined seed oils, sugar, wheat flour, maize, food pastes, tomato preserves. — (⁵) i. e. salted fat, pork, lard, butter, cheese and preserved fish.

This series of measures has enabled the markets to be brought into equilibrium, as will be seen from the movement of the index numbers of the wholesale prices of the raw materials and manufactured goods of interest to agriculture.

It will be seen from the above table that the period 1934 to 1938 (inclusive) was marked by a general upward movement in prices, the rise in the case of raw materials being more marked among such as are of vegetable origin, and in the case of manufactured goods among those of animal origin. During the first seven months of 1939 prices tended to remain stationary. Since July 1939 the index number of wholesale prices has not been published.

The new organization of agricultural producers, who are grouped into provincial consortia under the aegis of a national federation, is certain to contribute greatly to the protection of agricultural products, and so to the improvement of the position of the farmers

External trade.

Development of external trade - The following figures show the changes in Italian foreign trade in recent years

Italy's Foreign Trade 1935-1939 (a)

(thou-and lire)

Period	Food-stuffs and live animals	Raw materials for industry	Manufactured and semi-manufactured goods	Total
<i>Imports</i>				
1935	1 123,396	3 442,559	3 224,002	7,789,957
1936	925,348	2,494,104	2,619,727	6,039,230
1937	2,889,641	6 244,881	4,807,608	13,942,180
1938	1,421,120	5,298,450	4,404,312	11,123,882
January-July 1938	860,853	3 284,246	2 831,015	6,982,114
January-July 1939	948,462	2 758,379	2 377,346	6,084,187
<i>Exports</i>				
1935	1,758,738	529,746	2,949,753	5,238,237
1936	2,043,625	474,272	3,029,195	5,547,092
1937	3,085,512	970,511	6,377,500	10,433,583
1938	3,341,703	832,649	6,204,723	10,379,075
January-July 1938	1,832,943	507,246	3,549,630	5,889,662
January-July 1939	1,784,636	498,220	3,675,943	5 958,140

(a) Italy's trade with her possessions in Africa and the Aegean is included in these figures.

Since July 1939 foreign trade statistics have not been published.

The table shows that in 1938 there was a fall of 2,818.3 million lire in imports and 54.5 million lire in exports as compared with 1937. A comparison of the first seven months of 1939 with the corresponding period in 1938 shows that the same tendency persists as regards imports, whereas exports increased by 68.5 million lire.

About half of the total decline in imports in 1938 as against 1937 is accounted for by a fall in the value of imports of foodstuffs and live animals of nearly 1,500 million liras. This decline in foodstuff imports is in accordance with the attempt to render the country self-sufficient in foodstuffs, and was even accompanied by an increase in exports of goods in this category during the same period.

Regulation of external trade. — Foreign trade in Italy is assuming more and more the character of a public utility function. The protection of the home market continues to be carried out through the general control of imports. After bringing foreign currency dealings under control, the government extended the quota system to all imports. In addition, since January 1, 1940, all imports authorized directly by the customs offices on the basis of imports in 1934 have been subjected to a system of ministerial licences (Ministerial decree, December 28, 1939) ⁽¹⁾.

As regards the internal distribution of imported goods, the formation of specialized organizations for purchase and sale abroad were encouraged.

For agriculture there is the "Live-stock Importing Company limited" (*Società Anonima per l'Importazione del Bestiame*), the "Company for Exports and Imports of Farm Seeds" (*Compagnia Esportazione Importazione Sementi Agricole*), the "Poultry Products Company" (*Compagnia Importazione Esportazione e Commercio Prodotti Avicoli ed Affini*) and the "Egg Trade Company" (*Compagnia per il Commercio delle Uova*).

The first is concerned with all activities in connection with the import of cattle and pigs and their fresh meats, chilled or frozen and in their distribution between the different areas and markets of the Kingdom. It follows market trends and attempts to harmonize stockraisers' interests with those of consumers. The Company also plans to encourage the setting up of refrigerating concerns and organizations for the administration of markets. The Poultry Products Company aims at marketing national output on the home and external markets. The Farm Seed Company and the Egg Trade Company are similar bodies in organization and aims.

To protect exporters in their trade with foreign countries, an exchange guarantee and insurance against risks arising from other causes have been introduced.

The royal decree of December 22, 1939, No. 1908 ⁽²⁾, is of particular importance. By this decree a "general department for export services" is set up under the Ministry of Trade and Foreign Exchange for the development of Italian trade with foreign countries. Of the three principal services contained in this department, the first will have amongst other tasks that of examining and putting into effect useful proposals about exports. In particular it will encourage projects referring to new markets or markets with free exchange. It will also control prices, eliminating all harmful competition between national producers. The second service will have, among others, the task of encouraging forms of exchange other than those balancing themselves through the clearing system. It will also inform producers of the needs and conditions or foreign markets. The third service will be concerned mainly with problems and trends in goods of importance for the self-sufficiency policy.

Trade treaties and agreements. — The principles of reciprocity and compensation to which Italian trade policy has given increasing adherence, are found in the trade agreements concluded or modified in 1938 and since January 1, 1939—among others, those with Argentina, Bulgaria, Greece, Hungary, Romania, Turkey and Yugoslavia.

⁽¹⁾ *Gazzetta Ufficiale del Regno d'Italia*, No. 302. Rome, December 30, 1939.

⁽²⁾ *Gazzetta Ufficiale* No. 301. Rome, December 29, 1939.

A protocol of June 1, 1939 supplementing the trade convention with Argentina of March 4, 1937 laid down a list of quotas for imports into Italy of Argentine goods to a total value of 460 million lire: 120 million for wheat, 75 million for wool, 55 million for chilled and frozen meat and 51 million for maize. Against these quotas Argentina agrees to grant import permits of an equivalent value and at the official rate, which favours exporters by about 20 per cent. in relation to the free rate. Italian exports include materials of cotton, wool, silk, hemp and rayon.

The 1934 agreement regulating exchanges between Italy and Bulgaria, was renewed in 1939. During the first six months of 1939 Italy exported goods to Bulgaria to the value of 45 million lire, against 35 million lire in the corresponding period of 1938. These exports include cotton goods, artificial fibres, citrons fruits, etc. Among the chief products imported from Bulgaria by Italy are wheat and oilseeds. She also imports small quantities of poultry, eggs and tobacco.

In January 1938 Italy concluded a trade agreement with Greece which was modified in June 1939 with a view to increasing exchanges between the two countries. Exports from Italy, which had been 54,600,000 lire in 1934 and 83,541,268 lire in 1937, rose to 93,604,677 lire in 1938. For the same years imports rose from 17,300,000 lire to 36,500,000 lire and to 64,745,581 lire respectively. In the first seven months of 1939 imports (principally of tobacco and olive oil) amounted to 43,716,000 lire as against 58,915,000 lire in the same period of 1938, while exports rose from 61,316,000 lire in the latter period to 68,201,000 lire in the corresponding period of 1939. These exports consist principally of yarn and materials of cotton, hemp and wool.

Agreements were concluded in 1938 to develop exchanges between Italy and Romania. As a result of these agreements Italy imported goods from Romania to a value of 234,763,000 lire as against 147,894,000 lire in the corresponding period of 1938, whilst Italian exports rose to 163,433,000 lire as compared with 70,652,000 lire during the same period of 1938—giving an adverse balance of 71,330,000 lire against 77,242,000 in the same period of 1938. Among the most important of these imports are maize, wheat, livestock and oilseeds, and among exports rice, cotton yarn and materials, and wool yarn.

An agreement of October 1939 widened the scope of trade relations between Italy and Yugoslavia. It is hoped to raise the figure for all transactions from the 250 million lire per annum provided in the agreements of September 1936 to about 900 million lire. In 1934 Italian imports were 204.4 million and exports 140.1 million lire; in 1937 the figures had risen to 253.7 millions and 192.1 millions respectively, and in 1938 they were 150 and 219 millions respectively. In the first seven months of 1939 imports from Yugoslavia were valued at 120.2 million lire and exports to Yugoslavia at 155.7 million lire. The later agreements envisage an increase in wood, wheat and livestock quotas as regards imports from Yugoslavia, and an increase in exports from Italy of industrial products.

Measures relating to the marketing of agricultural products.

Maize, rice and olive oil pools. In the last few months the system of compulsory pools (*ammassi*) has been extended to these three products.

The maize pool, regulated by ministerial decree of August 26, 1939 ⁽¹⁾ was instituted to avoid price increases which might react unfavourably on animal husbandry and on the districts in which this cereal is consumed.

(1) *Gazzetta Ufficiale* No. 220, Rome, September 20, 1939.

The average annual output of maize (31,277,000 quintals for the three years 1936-38) still remains considerably below requirements, which are estimated at between 32 and 33 million quintals. The result under the free trade system was that, although the price was fixed for 1939 at 90 lire per quintal, it rose considerably as soon as the bulk of the output had been sold. Hence the need for stabilizing the price. This measure affects all the saleable output estimated at about a third of the average crop.

The obligation to hand over maize to the pools falls on the producer or anyone with the right to dispose of this product. It is not necessary, however, to hand over to the pool maize for the immediate requirements of the producer, including the quantities needed for his dependents and employees, feedstuffs and seed. These quantities will be determined by the cereals section of the provincial consortia of agricultural producers ⁽¹⁾ of each province on the basis of the requests of the producers. Maize handed over to the pools must be consigned to the warehouse prescribed by the above section. The section may arrange for the maize to be stored temporarily or for the whole period by the holder. In this case the holder, as depositary, is responsible for the maize entrusted to him, and when the maize is handed over to the pool will receive advances of not less than 80 per cent of the basic price of the product. This price was fixed at 98 lire per quintal for 1939-40, up to October 1940. Persons handing over maize and authorized to store the product in their own store-houses will receive for each quintal fair compensation for storage and other costs.

Quantities which are not handed over to the pools, as representing the direct needs of the producer, but subsequently prove to be in excess of these needs must be handed over to the pools.

The pool for rough rice, which is regulated similarly to that for maize, was introduced by the decree law of October 12, 1939, No. 1682 ⁽²⁾. Its establishment was entrusted to the National Rice Office (*Ente Nazionale Risi*). The work of this office, which was initiated in 1931, has had the following results: the area under rice, which in 1922 had fallen to 116,000 hectares, rose in 1939 to 156,000 hectares, total output increased from 4,713,000 quintals in 1921 and 6,622,000 quintals in 1931 to the 8,200,000 quintals estimated for 1939, with an average yield during the two years 1938 and 1939 of 55 quintals per hectare. Exports, which had fallen in the 1931-32 season to 2,188,000 quintals with a value of 147,000,000 lire, rose in the 1938-39 season to quintals 2,500,000 with a value of 250,000,000 lire. In 1933 the producer received an average of between 37 and 38 lire per quintal. Now he gets 100 lire per quintal for his *originario* rough rice. The cost of running the National Rice Office was kept down to a figure of only 0.45 lire per quintal of rough rice.

The pool for home-grown olive oil, set up by the decree law of October 12, 1939 ⁽³⁾ was based on the need for stabilizing the price at a remunerative level, and so helping to expand production. The national requirements of food oils fluctuate around 3,000,000 quintals, but estimating that the increase in population requires annually from 30,000 to 35,000 quintals of oil more, the High Commission for Autarchy fixed the average annual output of olive oil to be reached at 3,500,000 quintals; this both to cover internal consumption and to expand exports of high quality oils. About 160 million trees are employed in olive growing in Italy to-day, giving

(1) See the Chronicle on Italy in the June 1939 number of this *Bulletin*, p. 302.

(2) *Gazzetta Ufficiale* No. 270. Rome, November 21, 1939.

(3) *Gazzetta Ufficiale* No. 259. Rome, November 8, 1939.

an average yield of 2,200,000 quintals of oil. There is therefore a gap of about 800,000 quintals to be made up which is at present covered by imports of oilseeds. The plan now being applied to achieve this end can be summarized as follows: (a) Extension of the area under olive trees by the conversion of land as yet under wild olive trees into land with the cultivated variety and by the grafting of thin wild olive trees: the decree law of 1938 put the sum of 40 million lire at the disposal of olive growers for this purpose: a maximum of 4 lire for each plant brought up to standard, and a contribution of 30 per cent to the cost of preparing and maintaining the land. During the first ten months in which this law was in force 2 million olive trees were planted. (b) Reconstitution, rejuvenation and improvement of olive trees and bushes; this work was carried out by the olive growers' consortia in different ways, the chief method being to arrange provincial competitions with prizes. During the two years 1938 and 1939 the olive-growing section of the National Federation of Agricultural Producers Consortia (*Federazione Nazionale dei Consorzi Provinciali tra i Produttori della Agricoltura*) supplied the necessary technical staff, and in this way 1,149,410 olive trees received attention. This work will be extended to a third of the area planted with olives—about 750,000 hectares. (c) The adoption of methods of cultivation based on the most modern technique and practice, this is done through instructional courses, practical demonstrations of cutting, the allotting of fields to fertilizer experiments, and the study of species of olive tree and their biology. (d) Improvement of contracts for agricultural labour.

The results of this work for the improvement of Italian olive growing will be shown by the "National Olive Production Competition" (*Concorso Nazionale per l'Incremento della Produzione dell'Olio*) in which more than 4,000 farms will take part.

It is sought to increase the average output of the olive tree to between 2.30 and 2.40 quintals per hectare. An essential condition for the attainment of this purpose is the fixing of a stable and remunerative price for oils, such as the recently created pool is intended to assure.

Land system.

Settlement of the Sicilian latifundia. In the work of land reclamation and improvement aiming at increasing national output and creating new centres of rural life the settlement of the Sicilian latifundia ordered by the law of January 2, 1940⁽¹⁾, occupies a prominent place. The economic and social importance of this problem is shown by the following figures: There are on the island 452,419 farms with an area of 2,101,000 hectares, of these 2,034 have a total area of 591,209 hectares, 892 covering a total area of 432,488 hectares; 104 farms covering an area of 100,166 hectares have an average area of between 500 and 1,000 hectares; and 64 farms comprising 119,477 hectares have an area of over 1,000 hectares each.

This distribution of property is the reflection of an agrarian organization the typical characteristics of which are: (a) the extensive cultivation of wheat alternating with broad beans and sulla; (b) the lack of financial investment and poor agricultural technical; (c) the separation of the peasant from the soil, the peasant living in large rural centres and returning to the fields, which may be as much as three hours walk from his home, only for the seasonal employments of hoeing, sowing and harvesting.

(1) *Gazzetta Ufficiale* No. 14. Rome, January 18, 1940.

(d) the unsatisfactory nature of the labour contracts, (e) the impoverishment of the soil and the insufficiency of its output. The value of the latter barely reaches 1,000 lire per hectare; consequently the returns to labour and property are low.

These features of the economic organization of the latifundia are also often aggravated by special local conditions such as malaria in certain areas, the irregular supply and lack of water, the inadequacy of the road system as also of the peasants' houses and of the small centres intended to satisfy the requirements of the public services. There exists consequently a whole series of problems which private enterprise was not always in a position to deal without assistance from the State. The Italian Government is offering this assistance by arranging a plan of work which within ten years is to effect the settlement of 500,000 hectares and the formation of 20,000 family farms each with an average area of 25 hectares. The total area so far declared subject to reclamation in Sicily amounts to 728,588 hectares, but work is in progress only on an area of 213,473 hectares, while more than a million hectares are still being cultivated extensively.

It is hoped in this way to achieve a new land and agricultural organization based on continuous and intensive cultivation, such as will increase production and offer the agricultural labourers continuous work and a fixed abode.

The expenses incurred in the necessary preliminary work of eliminating local obstacles of a physical nature are assumed by the State, either in full or by the payment of very heavy subsidies (87.5 per cent. of expenditure). By this work roads will be opened up, water courses put in order, land drained, aqueducts built, rural centres erected, etc.

After assuring in this way the general conditions necessary for the conversion of the latifundia areas, the owners of the land to be transformed will be called upon to make their contribution, using the results of work carried out by the State to introduce new methods of cultivation on their land, the State will pay 38 per cent. of the necessary expenditure.

In view of the technical and financial difficulties presented by this problem a special organization has been set up called the *Ente per la Colonizzazione del Latifondo Siciliano* to assist the proprietors in their work of conversion. Those of the proprietors lacking the technical or financial means to carry out the necessary work of conversion may entrust the work to this special institution. When the work has been completed this body will return the holdings in full to those of the proprietors who can repay the costs of conversion after deduction of the State's contribution. Proprietors unable to repay the expenses incurred either in whole or in part will pay the debt by handing over part of the converted land to the *Ente*.

To ensure that this land conversion be carried out as economically as possible the work must be based mainly on manual labour. The establishment of closer bonds between the workers and the land is another feature of this settlement plan. In imposing on proprietors more equitable labour contracts it is hoped to give the settlers a joint interest in the gradual improvement of the land, and the contracts employed will relate mainly to improvement farming.

If in spite of the co-operation of the new institute there are proprietors who refuse to submit to the obligation of converting the land, the institute will have power to expropriate the lands belonging to them against compensation and to create the new form of organization for production directly.

A certain proportion of the land will become the property of the *Ente* as a result of expropriation and the cession of a part by the proprietors. Thus a fund of land will be formed which the institute will use for forming small peasant properties to be allotted directly to small farmers. To preserve these new small holdings regulations will be issued to protect them against future parcellation resulting from hereditary succession.

It is estimated that the whole cost of the plan will amount to 2,500 million lire, of which 1,000 million will fall on the State, 400 million for the carrying out of public works and 600 million for subsidies to works effected by the proprietors; 1,500 million lire will remain therefore to be found by the individuals affected, either from their own resources or through recourse to credit.

With a view to supplying the *Ente di Colonizzazione* with the capital it requires, both to carry on its work and to enable it to finance proprietors requiring to increase their available funds, the Deposit and Loans Bank (*Cassa Depositi e Prestiti*) and other public institutions are authorized to grant loans to the *Ente* to the amount of 400 million lire. To assure the lending institutes of the regular repayment of sums lent, it is provided that the granting of all loans must take place with the authorization of the district farm inspector, who must supervise the use made of the loans granted for purposes of land conversion. It is also provided that credit granted to proprietors by the *Ente*, whether for the repayment of expenditure incurred in the conversion of real estate or for advances made direct to the proprietors must be secured by a preference mortgage on the improved land.

G. COSTANZO.

BIBLIOGRAPHY ON ECONOMIC AND SOCIOLOGICAL SUBJECTS

PERTE, JEAN (Président de l'union des offices de comptabilité et de statistiques agricoles de France): *La comptabilité agricole en France*. September 1939, Librairie agricole de la maison rustique, 26 Rue Jacob, Paris.

This work is divided into four parts. In the first the author analyses the causes for the delay in introducing farm accountancy into France and goes on to consider the reasons and conditions for the success of farm accountancy offices.

The method which he proposes is so simple that it is open to all cultivators, it is confined to the analysis of concrete and well-known facts, avoiding all conventions and practically all estimates. It offers great precision in the presentation of the farm accounts and summarizes the financial mechanism very clearly.

The second part contains a theoretical account of what is meant by the profits of a farm free from debt and held in lease. Assets will not include the value of the land and buildings, but for this can be substituted the value represented by the capitalized rent.

In the third part practical advice is given on how to keep the accounts, while in the fourth will be found some very pertinent remarks on the service rendered by accountancy to farming through the assembling of really valuable material, the employment of which may be extended practically without limit to the most varied fields of agricultural economics and policy.

The author then gives a statistical example of the keeping of account books on a French farm.

This book will stimulate the movement which is taking shape in France. This movement is of an essentially professional character, and, at the instigation or through the direct initiative of the various existing organizations, is setting up regional offices more or less closely linked with the groups by which they were started, and forming special services of powerful syndicates.

Gefüge und Ordnung der deutschen Landwirtschaft. published as a collective work of the Research Service and arranged by KONRAD MEYER, Reichsnährstand Verlags-Gesellschaft, Berlin, 1939, pp. 752.

This collective work was published on the occasion of the meeting of the International Agricultural Congress at Dresden in June 1939, being intended to provide those attending the Congress with a general survey of the structure and organization of German agriculture, and one can only say that it admirably accomplishes its purpose. Fifty outstanding representatives from scientific, administrative and farming circles inform the reader on all questions of population, the natural and economic bases of German agriculture, the main features of the agricultural economy (the size of farms, ownership and tenancy conditions, the exploitation of the soil, stock-raising, farm technique, farm turnover etc.), the aims and principles of the agrarian policy, the land laws, the increase of production by special means (land improvement etc.) land settlement, the legal organization of labour, the conditions and development of production, agricultural credit, co-operatives, market regulation, technical agricultural education and advice..... in short there is no important topic of German agriculture which does not receive consideration. For this reason the work may also serve as an excellent work of reference.

H B.

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MONTHLY BULLETIN

OF

AGRICULTURAL ECONOMICS AND SOCIOLOGY

SOME REMARKS ON THE AGRICULTURAL ORGANIZATION OF THE TROPICAL COUNTRIES OF THE ANDES ⁽¹⁾

SUMMARY: I. *Position, Area and Relief* — II *Climate* — III *Soil and Vegetation*. — IV *Population* — V *Transport* — VI *Land Tenure System and Economic Organization of Farming*. Land tenure system Types of farming and labour conditions Capital and credit

I. — Position, Area and Relief.

The territory of the five republics of the tropical Andes (Venezuela, Colombia, Ecuador, Peru and Bolivia) extends from latitude 12°N. to latitude 22°S. and covers an area of 4,600,000 square kilometres ⁽²⁾.

In the north it borders on the Atlantic Ocean and the Caribbean Sea, and in the west on the Pacific Ocean.

In this area three separate regions can be distinguished based on the natural features—a central mountain region, agriculturally the most important, a more or less broad coastal region, and a low-lying region in the east which, although large, remains as yet the least important from an agricultural point of view.

(a) The mountain region, formed by the Andes, covers a wide belt running parallel with the seas bordering the territory. Its width varies between 150 and 500 kilometres and the region is mainly rugged, the flat and undulating arable lands being very restricted. Throughout two main and parallel ranges can be distinguished, known as the Western and Eastern Cordilleras. In Colombia, however, there is a third range, known as the Central Cordillera, which is separated from the Eastern Cordillera by the Magdalena valley and from the Western by the Cauca valley.

The summits of the Cordilleras are very high, varying between 3,000 and 6,000 metres, while the passes are few and difficult to employ either for railways or even for roads.

(1) This study was kindly placed at our disposal by Dr. Mariano Lugari, who has lived and worked for many years in this area, of which he possesses a first-class knowledge based on personal experience.

(2) This article does not cover Venezuelan Guiana, which is situated on the right bank of the Orinoco and little known. Agriculture in this area, which extends for nearly 500,000 square kilometres, is not at present of great importance.

(b) The coastal region of Venezuela, Colombia and Ecuador rarely exceeds 150 kilometres in width, and broad plains are only found in the deltas of the more important rivers—the Orinoco, the Magdalena and the Guayas, and round the lake of Maracaibo.

The Peruvian coast often ends in cliffs or in hills reaching down to the sea, but sometimes narrow plains and valleys are found along the coast, and these are very important for agriculture when watered by the rivers coming down from the Cordillera. Hence in the coastal region of Peru some forty oases are to be found scattered across an otherwise arid territory, these oases varying in area between 1,000 and 50,000 hectares and depending mainly on the flow from the watercourses which cross them.

(c) The low eastern region, broader than the previous two, slopes down more or less gently from the Cordilleras to the Orinoco and the Amazon, except for the Chaco, which forms part of the Paraguay basin. In the part nearest the Cordilleras, mountains and hills are still found, and several plateaux; the rest consists in large plains stretching for enormous distances.

II. — Climate.

The climate varies greatly for many reasons such as altitude, latitude, rainfall, ocean currents, etc.

To describe, even summarily, the different climatic conditions and their importance for the development of agriculture a classification will be necessary from the point of view both of average temperature and of rainfall.

First of all it should be remembered that a climatological classification has always something rigid and arbitrary about it which cannot correspond exactly to reality nor cover all the different types of climate. And if this be true in general it is much more so in the case of a region where the records are limited and which shows wide variations, particularly in the mountain areas.

From the point of view of temperature the following four regions can be distinguished:

Hot climate: average temperature above 23° C.

Temperate climate: average temperature between 17° and 23° C.

Cold climate: average temperature between 12° and 17° C.

Very cold climate: average temperature between 7° and 12° C.

The possibility of farming ceases when the average temperature lies below 7° C. Stockraising too is impossible, except of lamas and alpacas, and that only in Peru and Bolivia.

The annual variation of the temperature between the different months has practically no effect on agriculture, especially in Venezuela, Colombia and Ecuador, where the difference between the coldest and hottest month is almost always less than 3° C. ; in Bolivia and Peru, however, variations in the monthly average temperature can be as great as 8° C., especially in the arid and semi-arid regions.

The daily variations in temperature are not as great as in other tropical regions, especially in rainy periods.

The extremes of temperature show wider variations, but affect agriculture only in the cold and very cold areas where they sometimes cause frosts leading to great damage particularly to potatoes.

A factor having more influence on temperature is altitude. It varies, according to district, by one degree per 100 to 300 metres.

Latitude also has an effect, although very slight, as rainfall or ocean currents often cancel its effects and reduce those of altitude. Particularly good examples of this are offered by Peru and Bolivia where, largely because of the more abundant rainfall, crops are grown at altitudes several hundreds of metres higher than is possible in Colombia, Ecuador and Venezuela, countries which are nevertheless nearer the Equator. Similarly the Peruvian coast has a much lower temperature than would be expected from its latitude, owing to the cold currents which rise to the surface a short distance from the coast.

For these reasons and others (winds, vegetation, etc.) there is no upper limit of altitude corresponding to a given average temperature.

As regards rainfall, from the point of view of agriculture five regions can be distinguished according to the average annual precipitation.

Dry region: less than 300 mm.

Semi-arid region: from 300 to 500 mm.

Region of average rainfall: from 500 to 900 mm.

Rainy region: from 900 to 2,200 mm.

Very rainy region: over 2,200 mm.

In the arid region no cultivation is possible without irrigation, only stockraising, in several cases with stock migration, is practised, and then not in all regions. The arid regions are almost all situated on the Bolivian plateaux and the Peruvian coast.

In the semi-arid region there is almost always a dry and a rainy season; if the second is sufficiently long, seasonal crops can be grown even without irrigation in those areas where the land does not dry too rapidly on account of too high a temperature, strong winds, excessively permeable soils or other reasons. Naturally it is always advantageous to irrigate the land to make sure of the crops or increase the yield.

The semi-arid region covers by far the greater part of the cultivated land in Bolivia south of latitude 16° S. and several of those parts of the cultivated areas of Peru situated at less than 200 kilometres from the sea. There are also areas with a rainfall not exceeding 500 mm. on the southern coast of Ecuador, in certain plateaux of this country, and along some parts of the northern coast of Colombia and Venezuela between longitudes 66° and 76° E.

Most of the land in the region of average rainfall is cultivated without irrigation; nevertheless irrigation would always be of advantage.

The distribution of rainfall varies from one part to another of this region, but it can generally be said that there is one dry season and one rainy one, with the exception that in Colombia south of latitude 6° N. there are two dry, or almost dry seasons of short duration, and two rainy seasons.

It is impossible to show, without the help of a large-scale map, the districts coming within the regions of average rainfall, or those designated as rainy, since almost everywhere they intermingle.

Rainfall in the rainy region is such that irrigation is practically unknown, except occasionally for rice plantations and in places where the rainfall is near to 900 mm., or in areas where there is a season of two or three months almost without rain. This last case occurs in the *llanos* of Venezuela and Colombia and in certain areas with a cold climate which, owing to the violent winds coinciding with periods of minimum rainfall, undergo intense evaporation during certain months of the year.

The same remarks apply to this region as were made about the region of average rainfall, with the difference that here, except in the *llanos* of Venezuela and Colombia, the dry seasons are shorter and less marked.

In the very rainy region, the excessive rainfall is the greatest natural obstacle to the development of a varied and remunerative agriculture. There is practically never a dry period, but only a short period during which the rains are less intense.

The very rainy region consists of the following three areas, in order of size.

(a) The eastern slope of the Andes and the districts situated at the foot of the Andes. This region is bound approximately in the north by an imaginary line running through the little Venezuelan town of S. Fernando de Atabapo on the left bank of the Orinoco, and the Colombian town of Florencia, capital of the administrative district of the "Comisaria du Caqueta". On the north-west this rainy region is bounded by the watershed between the Pacific and Atlantic basins as far as latitude 10° S, and then has as its western boundary a line stretching almost parallel with the coast and at an average distance from it of 250 kilometres as far as latitude 12° S. Further to the south, the boundary of the very rainy zone turns away from the coast, going in an inland direction and finishing a little east of the River Mamoré.

(b) A second very rainy region covers the whole of the western slope of the Cordillera of the Andes in Colombia, extending then into Ecuador to a few kilometres south of the Equator.

(c) A third very rainy region, though of much smaller extent, covers the central part of the River Magdalena.

These rainfall areas show very wide fluctuations, especially in the regions of average and heavy rainfall, and this makes the cultivation of crops—especially annual crops—hazardous, as much from excess as from lack of rain.

III. — Soil and Vegetation.

It is impossible to give a full and detailed description of the soil and vegetation of so extensive and varied a territory, little studied and in parts still unknown. Some remarks on the fertility of the soils and the most important types of vegetation will have to suffice.

The soils are more frequently light than heavy; they are, therefore, not very difficult to work.

Areas with a continuous and high fertility are not very common and their area is often very limited.

Although relatively little chemical analysis of the soil has been carried out, it can be said that, except for the arid and semi-arid regions, the soils are most frequently poor in phosphates and particularly in lime, while they are generally rich in potash. The forest areas and certain alluvial lands, except in the very rainy districts, are as a rule rich in nitrates.

Much damage is caused by erosion, mainly on the light soils situated on hillsides, owing to the violent winds in certain high-lying parts of the mountain region, and rainstorms, especially in the lower-lying areas.

The greater part of the territory is covered with tropical forests, particularly in the very rainy region, while there are also large stretches of woodland in the rainy region. In the areas of average rainfall the forest is less dense, and in the drier parts has more the character of wooded savannah land.

The greatest of the natural savannah lands are the *llanos* of Venezuela, Colombia and Ecuador, but savannahs are also met with in the lower and upper valleys of the Magdalena and on the mountains and plateaux with cold and very cold climate. In the temperate region natural savannahs are rare, but in the hilly districts very poor herbaceous vegetation is frequently found which turns green during the rainy season, supplying pastures of some importance. These hills are known as *lomas*.

IV. — Population.

The last census for Venezuela took place in 1936, and that for Colombia in 1938; for Ecuador, Peru and Bolivia there are only estimates of varying degrees of accuracy. The total number of inhabitants (excluding Venezuelan Guiana) cannot be much less than 25 million, which gives an average density of 5.5 inhabitants per square kilometre.

While there is not much material about the relative density of the population, some remarks can be made as to its distribution between different areas.

Much of the territory is very thinly populated with a density of population below 1 person per square kilometre.

The least populated areas are those where, for the moment at least, there is no possibility of agriculture assuming any great importance, on account either of unfavourable climate, poor soil fertility, periodic flooding, or inadequate means of communication.

Among the sparsely populated areas must be included the eastern lowland district, with an area of over 2 million square kilometres, the whole of the very rainy and very cold regions, and those parts of the Peruvian coast which are not irrigable.

The remainder of the land, amounting to practically one million square kilometres, supports at least four-fifths of the population, and there are places

where the population density exceeds 80 inhabitants per square kilometre. This relatively high density appears the more remarkable when it is remembered that, contrary to the case of most countries within the tropics, it is found in the temperate and cold regions.

This is due to the ethnic composition of the population, as will be explained below, and, in the case of Venezuela, Colombia and the Peruvian coast, to the fact that most of the exportable agricultural products require a climate with an average temperature lying between 18° and 23° C.

In the ethnic composition of the populations of these countries three main races are found—the Indian race, the white race, of Spanish origin, and the black race descending from the slaves imported from Africa. A great deal of miscegenation has taken place, particularly in Venezuela, Colombia and Ecuador, where mixed breeds are in a majority, if not absolute at least relative, whereas in Peru and Bolivia the Indian race, pure or almost so, forms an absolute majority of the population.

The population of Indians and mixed breeds with a high proportion of Indian blood predominate in the eastern lowland region (except the *llanos*) and on the upper plateaux with a cold climate; negroes and mulattoes form the majority in the warm areas except for the eastern lowland district.

The rural population of the temperate region is more or less mixed between the three races, but with a smaller number of mulattoes, especially in Bolivia and Peru.

The white population is in a relative majority in the towns of the cold and temperate regions and in certain country districts of the same regions, especially in Venezuela and Colombia.

The ethnic composition of the population has considerable importance for the agricultural system, owing to the differences in the food requirements, abilities and psychological and physical characteristics of the various races.

The Indian is largely a creature of custom in his diet, which is generally vegetarian, as also in the crops he grows and in his methods of farming. While he has admittedly taken over crops introduced by the Spaniards (wheat and barley) and stockraising, which the Spaniards also brought with them, and in several areas adopted the plough, he has nevertheless made no other progress in his agriculture. Furthermore, although a worker, the Indian does not attempt, even when he has the chance, to produce more and under better conditions in order to improve his lot. Again, he rarely turns to the growing of coffee, cacao, fruit or other trees.

The mestizo is more adaptable and hopes to improve his position, even if he often fails to attain his goal through lack of tenacity of purpose. He does not exclude tree-growing, and the very important development of coffee-growing in Venezuela and Colombia is due to him as much as to the whites.

The negroes and mulattoes prefer to live in a warm climate, and it is only by chance that one meets a black land-worker in areas where the average temperature is below 20° C. or a mulatto where it is below 18° C.

They are attracted by the idea of progress, but find it difficult to improve their position through lack of steadiness, or because they are over-optimistic and imprudent, not understanding the importance of saving. They accept hard work, but do not like anything requiring much care and attention; for this reason they do not take easily to horticulture, and it is difficult to make them prune their cacao trees with care or give the necessary attention to preparing their cocoa or coffee for sale.

Their preference is for a diet abounding in meat and fish.

The agricultural day labourers of white race are not very numerous. The whites are mainly found in the peasant classes—landowners, *métayers* and tenant farmers, and most generally in areas where the average temperature lies between 16 and 23° C. In the hot region it is very unusual to find whites working on farms as day labourers. Whites set up as farmers and doing the hardest types of manual labour themselves are also very rare in this region.

Health varies greatly, depending on the hygiene of the inhabitants but more especially on the climate, since the two diseases which are most widespread and have the greatest effect on working capacity only occur under certain climatic conditions.

Malaria can develop where the average temperature is above 18° C, but it is usually less serious where the average temperature is below 23° C and also where the climate tends to be dry.

Hookworm is very widespread in the malarial areas but more common in the temperate region.

These two diseases which affect the large majority of workers in the hot and temperate regions, have a great effect on capacity for work, both by reducing the number of working days of the cultivator and by giving rise to a state of general debility which naturally has a serious effect on the returns from labour.

Under-nourishment, which is particularly marked in the cold region, and the abuse of alcoholic beverages, which is common throughout the territory, also greatly affect the capacity for work of the people.

Seasonal changes in the demand for labour lead in certain parts to a migratory movement towards neighbouring districts, especially at harvest time in the more temperate zones, *e. g.* the coffee harvest in Colombia and Venezuela, and cotton and sugar cane in Peru.

There is also a permanent migratory movement, particularly marked in Colombia, caused by the desire to colonize lands left uncultivated by their owners or unoccupied lands belonging to the State. This movement, which was and still is strong in the centre of Colombia, is directed more particularly to the temperate rainy regions; the settlers come from regions with a similar or cold climate, since the peasants accustomed to a warm climate are afraid of temperatures lower than those prevailing in the areas to which they are accustomed.

Immigration of foreigners is very limited, and among those who do come the percentage of peasants is practically insignificant.

V. — Transport.

The difficulties raised by transport in all tropical countries are increased here by the forbidding physical configuration of the country, which forms a serious obstacle to the construction of roads and especially railways such as could offer transport services at a reasonable price.

The high cost and the difficulty of transport are the main causes of the relatively slow exploitation of the agricultural wealth of this area. Only part of the territory of each republic has been equipped with easy means of transport at a cost which is not a hindrance to the exploitation of the tremendous agricultural possibilities which exist.

The country most favoured from this point of view is certainly Venezuela since its best areas are situated close to the sea, while it is one of the richest countries for petrol in the world, which means that transport by lorry is very economical.

River transport for long distances is carried on on the Orinoco and its tributaries.

Colombia, although less favoured than Venezuela, has solved the majority of her more urgent problems relating to means of communication, especially as regards the transport of merchandise.

The two most important events for the progress of transport in Colombia were firstly the introduction of steam navigation on the Magdalena River half a century ago, and more recently the opening of the Panama canal, which speeded up the exploitation of the agricultural wealth of those areas where access to the sea was easier from the Pacific coast.

In the last fifteen years Colombia has made remarkable progress in solving her transport problems. The greater part of the most important railways and a large number of roads, serving principally for transport between the majority of agricultural districts, have been completed.

In Ecuador the railway running from Ibarra to Guayaquil brings to the coast the agricultural produce of the mountain areas known to the Ecuadorians as the *Sierra*.

In Peru the natural obstacles to the construction of railways or roads to facilitate communications between the mountain areas and the sea are much more serious and are still far from being overcome, although considerable progress has already been made.

Bolivia has two railways connecting her with the sea, though one is interrupted by the navigable Lake Titicaca.

Communications between the mountainous region and the low eastern plain are infrequent and difficult in all the Andean countries with the exception of Venezuela.

The coast offers few naturally sheltered ports, but in recent years several others have been suitably adapted, particularly in Colombia.

River navigation on the Amazon and its tributaries while not intense is none the less an important element for the economic development of the Amazon country.

For relatively short distances, *viz.* from one to two hundred kilometres, or a little more in areas where transport cannot be effected by boat or on wheels pack animals of various types are employed. Sometimes animal transport of this primitive kind is even used in competition with lorries, particularly for distances of a few score kilometres. As regards the animals used, in parts which are neither too hot nor too rainy preference is given to mules and asses. Horses are used a little everywhere. Oxen and also cows are favoured in the cold and even very cold regions. In the mountain areas of South Peru and on the upper plateaux of Bolivia the beast of burden most used is the lama.

VI. — Land Tenure System and Economic Organization of Farming.

Land tenure system.

The State is the owner of a large part of the land, but while the areas are immense the lands are mostly situated in regions which are at present inaccessible and which cannot be utilized without a great expenditure of capital. Capitalists, however, prefer to invest their resources where they will provide profitable returns within as short a period as possible.

The lands forming part of the State domain are known as *baldios*. Capitalists buy large stretches of them, either with a view to exploiting them at some fairly early date for stockraising, or, more rarely, to plant them out with crops.

Small and average-sized areas are bought, or more frequently occupied, by peasants. These, while they may occasionally have other resources, generally have no capital beyond their working implements and, sometimes though not always, a few animals, some food supplies and a very strong desire to gain an independent position.

Most frequently those settling on these small areas do not buy the holding, even where the law would require it, but confine themselves to occupying it and becoming owners by right of acquisition. In some districts peasants have acquired rights of ownership on large areas of land left uncultivated by the owners.

Those who fail in their attempt at settlement, whether through inability or through ill fortune, are replaced sooner or later by new occupiers, unless the failure is attributable to an error in the choice of the holding to be settled.

Settlement in the form of medium-sized and small holdings in the *baldios* has assumed great importance in Venezuela and especially in Colombia, where these types of colonization have been and will be continued for a long time. It is largely due to this that in the last sixty years the cultivation of coffee has spread so rapidly in the temperate parts of the departments of Antioquia, Tolima and Valle del Cauca which produce at least 60 per cent. of Colombia's coffee.

In the other tropical countries of the Andes the settlement of the *baldo*s by the peasants has proceeded at a much slower rate, owing to less favourable natural and political conditions, and more particularly to the less developed spirit of colonization, which must be attributed in large part to the ethnic composition of the peasant population, consisting as it does mainly of Indians of pure breed or very little mixed. These lack a spirit of initiative and, whilst generally members of agrarian communities, rarely try to improve their position by facing the difficulties which a colonist must of necessity encounter.

The distribution of rural property varies between the different countries as a result of natural conditions, the situation of the land and reasons of an historical, political and economic nature.

Large estates are much more numerous in Peru and Ecuador than in Venezuela, Bolivia and Colombia.

In these last three countries large properties are commoner in the stockraising districts and particularly in the *llanos*, whereas in Peru and Ecuador a large number of big holdings are also to be found in the crop-producing areas.

Some average-sized and small holdings are to be found everywhere, but relative to its population Colombia has the largest number of land holdings.

In South Colombia and Ecuador, but to a still greater extent in Peru and Bolivia where the Indian element predominates, large stretches of land in the temperate and more particularly in the cold regions belong to agrarian communities formed in Inca times; in Bolivia 67 per cent of the Indian population belongs to these communities.

The members of the communities only have possession of the land which they are cultivating and may not dispose of it by will, though in practice possession almost always remains in the hands of their descendants, especially when the community controls a large area. Each member works the land in his possession on his own account and can dispose of his crops as he likes. The system of communities forms an obstacle to the carrying out of various improvements and especially to plantings of a permanent nature, such as coffee and fruit trees, etc. The members of the communities have no desire to become sole owners of their holdings, while, where communities have been liquidated, the former members have practically all sold their property and so reduced themselves to an economic position worse than their former one.

The white, black and mixed breed cultivators on the other hand have a very strong desire to become proprietors, and the governments encourage the realization of this desire, particularly in Colombia and Venezuela.

Impossible though it may seem for countries so thinly populated, there are places where the holdings or possessions (in the communities) are too small to allow of a reasonable system of farming.

Types of farming and labour conditions.

As in almost all tropical countries, agriculture is extensive rather than intensive. We shall proceed to explain the meaning of these two adjectives.

If agriculture is considered to be intensive where no piece of land is left uncultivated, then it could be said that there are several places where intensive

agriculture is carried on, notably in the most thickly populated areas or where the existence of large farms for raising livestock leaves for the peasants only very small holdings so that they are obliged to work without respite to provide the most urgent necessities of existence. But if by intensive agriculture is meant that, apart from leaving very little land uncultivated, all the resources of agricultural technique are invoked and much capital expended to increase production, then it can safely be said that, apart from the coastal part of Peru, the places where intensive agriculture is practised are very few and limited in extent.

There are several reasons for a more or less extensive type of agriculture being favoured, the principal of which are the plentifulness and low price of land and the shortage of capital and labour. For these same reasons stockraising employs a much larger area than arable farming and is also of a more or less extensive type.

For the same reasons again, but on account also of the risk of crop losses owing to changes in weather conditions, plant diseases and insect pests, it would be unwise to rely on a single crop. This explains why one rarely finds specialized crops, except in large farms and more particularly those where crops of a permanent character are grown, *e. g.* sugar cane for the manufacture of sugar, banana and coffee trees for export. Furthermore, the peasant practically always attempts to produce the greater part of his food requirements on his own farm, since as far as possible he wants to avoid buying from outside what he can produce on his farm. He generally prefers autarchy to free exchange.

Crop rotations are usually of the most simple types, leguminous crops rarely being included since their cultivation is little known; and as the use of fertilizers is very limited except in the Peruvian coastal region where guano is fairly extensively employed, the land has to be left fallow for fairly long periods. These fallow periods are very long in the temperate and hot regions where to work the land the plough is not used but is replaced, not by the hoe or spade as in the cold region, but by burning the natural vegetation. This vegetation spreads more or less thickly and rapidly over land which has been left uncultivated.

The result of this method is that only a quarter or fifth of the land of each farm can be cultivated each year, which, owing to the quantity of land available and its low price, is perfectly feasible.

Most farms are worked directly by their owners; lease holdings are much more unusual as also are métayage and share farming.

The rents of small holdings are most frequently paid in labour; the landowner lets a piece of land, the area of which may vary from a half to some dozen hectares and situated on the border or within a more or less large farm belonging to him, and requires of the farmer a certain number of days of labour. If the number of labour days demanded is too great relative to the area of land leased the landowner agrees to pay the farmer a wage fixed in advance, which is always below the normal wage. The farmer is generally conceded the right to graze his livestock on the landowner's pastures.

It is unusual to find the *métayer* system in the proper sense of the word; the contracts are rather such that the contracting parties share their crop in a variable proportion, at the same time agreeing to supply goods (land, seed, irrigation) or labour. The contracts assume widely differing forms.

One of the most common is that used on the coffee plantations. The landowner gives a part of his plantation to the farmer, who undertakes to do all the necessary work except the cutting, and to transport the coffee beans—using for this purpose the animals belonging to the landowner—to the factory for preparing the coffee for the market, where the landowner assumes responsibility for depulping, fermentation and washing; after which the coffee is divided into equal lots and each of the contracting parties takes charge of the drying of his share, which is then sold as parchment coffee to the exporters who complete its preparation in their factories.

Wages vary enormously from one country to another and from one district to another to a degree that seems almost impossible *e. g.* in the proportion of 1 to 15. Sometimes food is also supplied and occasionally even lodging. In the case of the coffee, cotton and sugar cane harvests wages are sometimes based on piecework.

The length of the working day varies from 7 to 9 hours, or even longer during harvest-time.

In some districts the women do practically the same work as the men, while in others they only assist with certain things at the harvest or in the sowing season.

Only in times of exceptional economic depression is there some slight unemployment amongst agricultural workers. At most times there is plenty of work, which explains at least in part why in many places the payment of rents is exacted in the form of labour.

Capital and credit.

Since these are new countries, the principal wealth of which has hardly begun to be exploited, capital is rather scarce. The supply of foreign capital is very limited, and only rarely is it invested in agriculture, unless in the case of certain export products such as bananas, sugar and cotton.

The natural consequence of this shortage of capital is high rates of interest, which is always a danger for every country from the point of view of agriculture, and more particularly in countries where the farmer's profits vary greatly owing to changes in weather conditions or fluctuations in prices.

The selling prices of nationally consumed goods vary greatly, owing to the very considerable variations in the quantities harvested. The big effect which these have upon prices is due to the fact that the internal markets for the majority of goods are rather restricted owing to the great distances between the various consuming centres and the high transport costs resulting from the geographical configuration of these countries.

The rate of interest varies between 7 and 12 per cent. for mortgage loans or loans on agricultural security when made by a bank, which, however, is

not the most frequent method, and particularly not for the peasants. These indeed often have to sell their produce several months before the harvest, at a price fixed in advance by the purchaser, and which is almost always half the price the farmer could realise were he able to sell his products after the harvest.

Loans on security, made by banks subsidized and controlled by the government, have succeeded in reducing anticipated sales of crops to reasonable proportions. In this field great service has been rendered to farmers and especially to coffee planters, even those with the smallest holdings, by the *Caja de Crédito Agrario* of Colombia.

(To be continued).

MARIANO LUGARI.

CHANGES IN THE PROFITABILITY OF AGRICULTURE IN INDIANA, MICHIGAN AND ILLINOIS FROM 1932 TO 1937

SUMMARY. Economic conditions in Indiana, Michigan and Illinois from 1932-33 to 1937-38. - Gross return from farms and its variations - Variations in farm expenses, working expenses and social income - The farmer's share in social income. - Comparison between the share in the social income accruing to third parties in the United States and in certain European countries. Profit or loss on the net return in the United States and in certain European countries

In 1936 we published an article in No. 2 of the *Monthly Bulletin of Agricultural Economics and Sociology* entitled "Some observations concerning farm accountancy methods in the United States." Now that we are in possession of accountancy results for the States of Indiana, Michigan and Illinois covering a period of six years, it is proposed to study the changes in the economic conditions in these three areas of the United States between the years 1932 and 1937.

Keeping to the method used hitherto, we shall deal successively with the gross return, farm expenses, the net return, social income and the profit or loss on total farm assets ⁽¹⁾.

⁽¹⁾ The *gross return* is the increase in wealth obtained on the farm in the course of a year by transformation, exchange and revaluation. It thus covers money receipts, contributions in kind to the household and to subsidiary undertakings, payments in kind to employees and increases in the farm inventory.

The *cost of production* covers the expenditure through which the gross return has been obtained; the cost of labour, including an amount representing family labour earnings; expenditure, including taxes and contributions in kind, required for the running of the farm; decreases in supplies and expenses incurred in improving land fertility; depreciation charges and interest payments on assets.

The difference between the gross return and the cost of production gives the *profit or loss on total farm assets*. This shows in what proportion the prices of agricultural products must be raised or lowered for the gross return to cover exactly the cost of production.

By subtracting working expenses (the portion of the cost of production consisting of the outlay on fertilizers, seed, fodder, repairs, depreciation, and costs of management) from the gross return, the *social income* is obtained, which consists of the sum of the returns from the farm, thus including the net return (the actual return on assets), taxes and cost of labour.

Diagram I enables us to sketch the position of farmers during the period under examination. After a period of economic recovery from 1933 to 1936 which was marked by a rapid increase in the gross return, a violent reaction set in in the autumn of 1937. Within a few months industrial production had fallen by 30 per cent., while the gross return from agriculture had fallen by between 20 and 60 per cent. according to the district. The restriction on production imposed with the enacting of the Agricultural Adjustment Act in 1933, combined with a series of bad harvests, led in 1934-36 to a big fall in the stocks accumulated from the abundant harvests of the depression period. The outcome was a reduction in supply such that the rise in the prices of agricultural products exceeded that of the general level of prices. In 1937, as a result of an exceptionally favourable season and abundant harvests, the volume of sales exceeded that of any year since 1924. However, from the beginning of the 1937-38 season excessive supplies and the influence of the general recession led to a reaction in agricultural prices. The price index for agricultural products (1910-14 = 100) fell from 129.8 in August and September 1937 to 100.4 in January and 94.7 in May 1938. The index of agricultural wages on the other hand rose from 111 in 1936 to 126 in 1937, that of taxes from 182 to 187 and that of the prices of farm requisites from 126 to 135. The increase in the volume of sales and government payments in 1937-38 was not enough to offset the fall in agricultural prices and the increase in farm expenses, with the result that the net return fell.

The farms under consideration have an average area varying between 70 and 90 hectares, and are mainly engaged in dairy production, mixed grain and livestock farming and grain production⁽¹⁾. For each of these groups of farms we shall follow changes in the gross return, farm expenses and the social income between 1932-33 and 1937-38. We shall then see what was the distribution of the social income between farmers, workers and the State. Finally, these considerations will lead us on to the relationship between costs of production and the prices of agricultural products—that is, the profit or loss on total farm assets expressed as a percentage of the gross return. This quantity shows in what proportion agricultural prices must be increased or diminished for the gross return exactly to cover the cost of production.

Gross Return.

In 1933-34 the economic position of farmers improved as a result of the rise in prices of agricultural products and energetic measures to keep down working expenses (Diagram I). This general improvement in the economic situation lasted into 1934-35 in spite of an extremely bad drought which reduced

(1) Throughout the rest of this article the farms have been designated by the names used in the original American accountancy records—dairy farms, grain farms and grain and livestock farms. These terms are only intended to indicate the branch of agriculture predominating, and must not be taken to mean that only this branch of production is practised.

TABLE I — *Gross Returns and their Components in Dollars per Farm and expressed as Index Numbers*

State		Milk and dairy products	Livestock	Field products	Others (increase in the inventory labour)	
(a) Dairy farms						
Indiana	1932-33	1 273	671	126	121	- 111
		50	28	17	5	100
	1933-34	1 071	980	632	441	3 127
		44	40	26	18	128
	1934-35	1 307	765	443	583	5 095
		53	31	18	25	127
	1935-36	1 240	1 035	569	974	3 815
		51	42	23	40	156
	1936-37	1 480	1 127	955	980	4 542
		61	46	39	40	186
	1937-38	1 662	1 099	1 315	473	4 549
		68	45	54	19	186
Michigan	1932-33	769	()	(¹)	(¹)	1 447
		53				100
	1933-34	510	632		60	1 502
		56	44		4	104
	1934-35	644	962	278	95	2 282
		65	66	19	8	158
	1935-36	1 116	1 012	323	261	2 712
		77	70	22	18	187
	1936-37	1 410	1 050	242	750	3 452
		97	73	16	53	239
	1937-38	1 417	1 049	286	372	3 124
		98	72	20	26	216
Illinois	1932-33	1 057	1 203	(¹)	53	2 313
		46	52		2	100
	1933-34	5 014	1 166	772	43	3 075
		47	50	33	2	132
	1934-35	1 132	1 563	288	62	3 375
		49	81	12	4	146
	1935-36	2 045	2 078	191	56	4 370
		88	90	8	3	189
	1936-37	2 793	1 523	500	48	5 464
		121	78	35	2	236
(b) Grain and livestock farms						
Indiana	1932-33	371	1 268	149	176	2 204
		16	56	20	8	100
	1933-34	400	1 579	687	455	3 121
		18	70	30	20	138
	1934-35	422	1 581	553	1 327	3 213
		19	70	39	58	186
	1935-36	439	2 555	861	1 447	5 332
		19	114	38	64	235
	1936-37	521	3 503	1 263	1 096	6 383
		23	155	56	48	282
	1936-38	526	3 441	1 050	372	5 389
		23	152	46	17	238

(¹) No figures

*** Ec. 3 Incl.

TABLE I (continued).

State	Years	Milk and dairy produce	Livestock	Field products	Others (increase in the inventory, labour)	Total	
(b) Grain and livestock farms (continued).							
Michigan	1932-33	661	(¹)	(¹)	(¹)	1,107	
		60				100	
	1933-34	658	541	580	70	1,858	
		59	49	53	7	168	
	1934-35	776	940	558	118	2,392	
		70	85	50	11	216	
	1935-36	956	1,613	506	339	3,504	
		86	146	53	31	316	
	1936-37	1,133	1,446	834	912	4,325	
		102	131	75	83	391	
	1937-38	1,161	1,320	703	335	3,579	
		105	119	69	30	323	
Illinois	1932-33	256	1,092	36	47	1,131	
		18	77	2	3	100	
	1933-34	204	1,415	1,124	10	2,852	
		19	99	78	3	199	
	1934-35	311	1,944	1,190	88	3,533	
		22	136	83	6	247	
	1935-36	362	2,606	702	93	3,763	
		25	182	49	77	263	
	1936-37	360	2,525	1,079	99	4,063	
		25	176	76	7	284	
	(c) Grain farms.						
	Indiana	1932-33	489	932	741	64	2,226
22			42	33	3	100	
1933-34		376	947	647	510	2,480	
		17	42	29	23	111	
1934-35		406	1,127	1,208	1,102	3,903	
		18	51	54	52	175	
1935-36		446	1,804	958	1,122	4,330	
		20	81	43	50	194	
1936-37		573	2,000	1,497	1,263	5,342	
		26	90	67	57	240	
1937-38		556	2,252	1,791	450	5,049	
		25	102	80	20	227	
Michigan	1932-33	511	(¹)	(¹)	(¹)	1,154	
		44	--	--	--	100	
	1933-34	537	419	932	88	1,976	
		46	36	81	8	171	
	1934-35	673	650	1,159	89	2,571	
		58	57	100	8	223	
	1935-36	777	1,173	967	91	3,008	
		67	102	84	8	261	
	1936-37	866	1,083	1,894	416	4,259	
		75	94	164	36	369	
	1937-38	853	1,015	1,050	482	3,400	
		74	88	91	42	295	

(¹) No figures.

TABLE I (continued)

State	Years	Milk and dairy product	Livestock	Field products	Other (increase in the inventory labor)	Total
(c) Grain farms (continued)						
Illinois	1933-34	50	643	440	5	1,148
		20	45	31	4	100
	1934-35	57	935	280	13	1,285
		18	66	162	3	249
	1935-36	101	1,303	310	0	1,714
		28	96	164	7	295
	1936-37	309	135	1,787	51	2,282
		25	151	126	6	311
	1937-38	111	1,061	70	118	1,950
		29	146	231	8	414

(1) No figures.

DIAGRAM I — Gross Return, Farm Expenses and Social Revenue in Indiana, Michigan and Illinois from 1932 to 1937

(Dollars per farm)

(a) Livestock farms

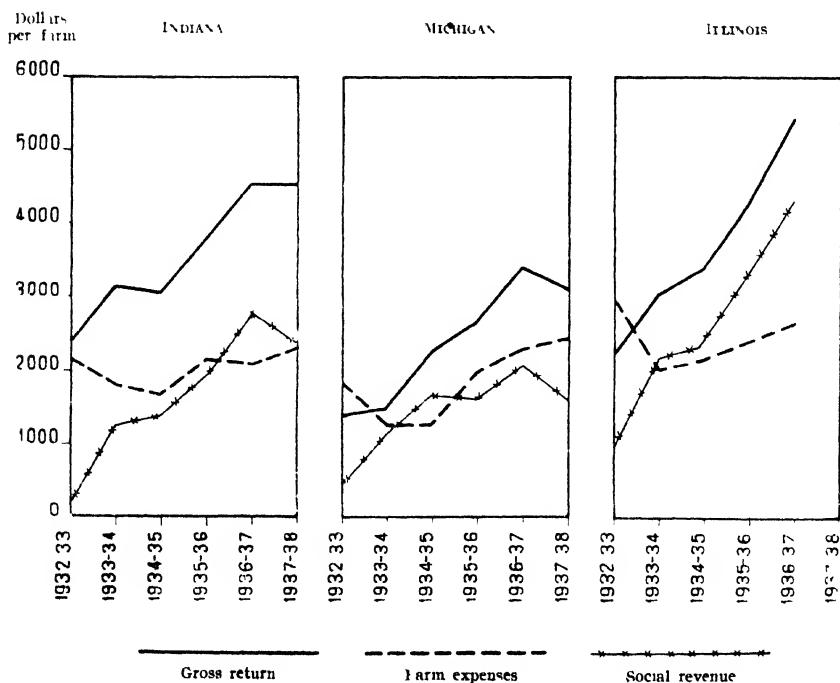
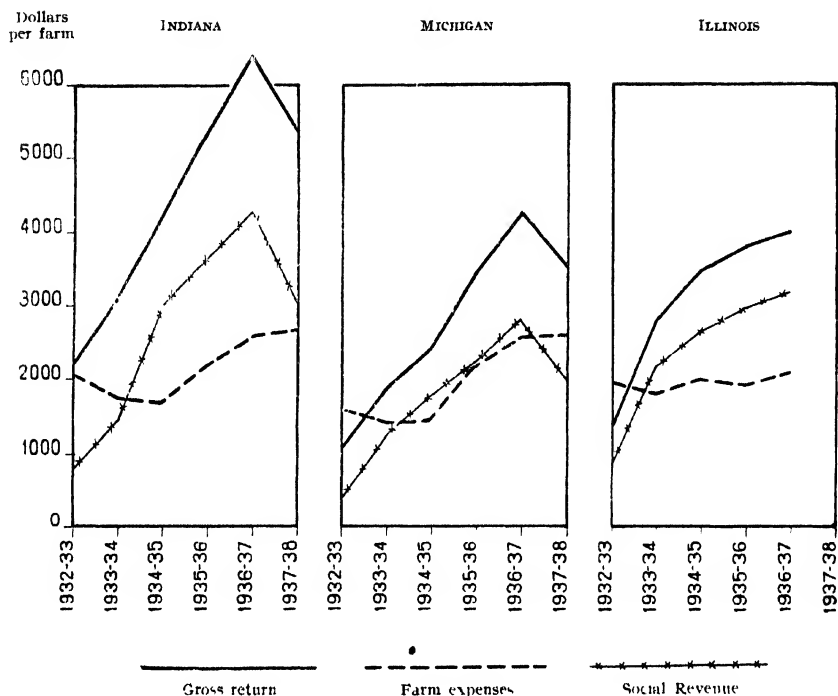


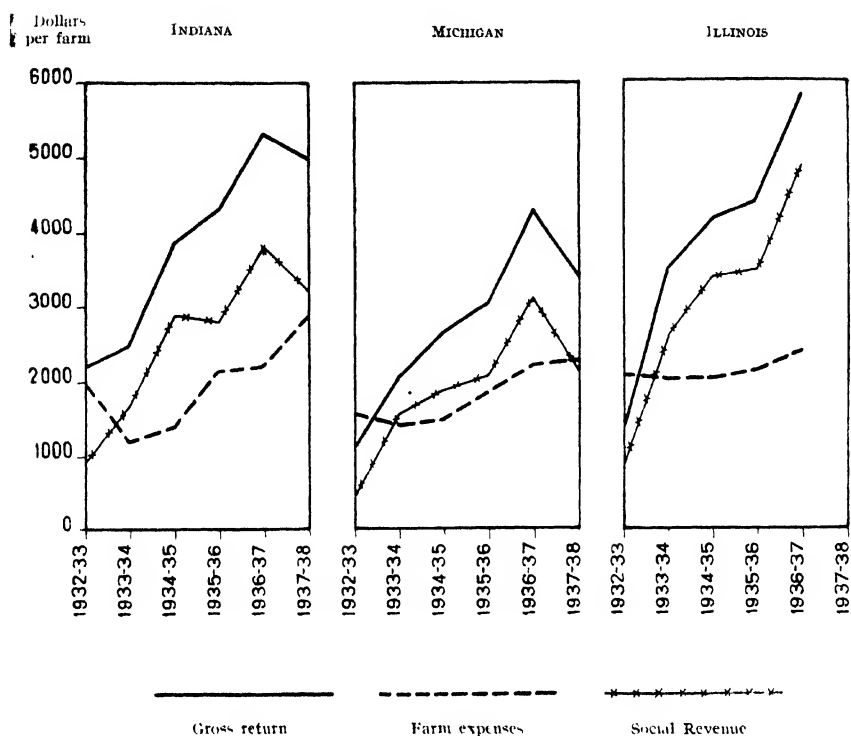
DIAGRAM I. (*continued*)(b) *Grain and livestock farms*

crop yields. The rise in prices made up for the fall in output. Sales of meat animals were greater than in normal times as a result of the shortage of fodders. In Indiana the increase in the gross return on grain and livestock farms and on grain farms (Table I) was largely due to the increases occurring in the inventory on crops harvested. Only on dairy farms did the gross return fall in 1934-35, this being due to the smaller returns obtained from produce-yielding stock and crops (Table I). It is on these farms that the drought appears to have exercised its most unfortunate effect on the final result. In the state of Michigan farms did not suffer greatly from the drought. In Illinois grain and livestock farms and grain farms showed the greatest increase in the gross return, having had good harvests of maize, wheat and soya.

In the 1935-36 season the index of cereal prices fell from 115 in January 1935 (1909-14 = 100) to 89 in December, while the price index for animal products rose, that of meat animals from 96 in January to 120 in December. The gross return from grain and livestock farms rose in a greater ratio than that from farms where grain and root crops preponderate. In Michigan price trends favoured principally farms where stockraising is the main branch of production.

DIAGRAM I. (continued).

(c) Grain farms



From 1935-36 to 1936-37 the price index for agricultural products moved from 108 to 110; in July and August cereals prices rapidly went ahead of the others. Prices of meat animals in 1936-37 settled at a level a little higher than in the preceding year. The gross return increased in proportions varying with the districts and system of farming, and was particularly striking on grain and livestock farms in Indiana and on dairy and truck farms in Illinois. In Indiana the increase in profits on produce-yielding stock was accompanied by a very large increase in the returns from sales of cereals, of which farmers marketed large quantities after July 1, 1936, when prices rose (Table 1). The same favourable conditions enabled Illinois cash grain farmers to make substantial profits (Table 1). Dairy farmers in Illinois did not allow themselves merely to benefit from the rise in cereals prices, but also intensified their dairy production (Table 1). A milch cow returned them an average of 114 dollars in 1935-36 and 131 in 1936-37. No group of farms in Michigan obtained in 1936-37 as high a gross return as in the other two states under examination; the greatest increase was obtained on grain and livestock farms; but the gross return was lower by 1,000 dollars than that obtained from similar farms in

Indiana and Illinois (Table 1). Unfavourable weather conditions greatly reduced the volume of crops. Nevertheless these were better in Michigan than in the other states of the Federation and farmers were able to sell their produce at really favourable prices; only the prices of eggs and wine were relatively low. Though starting at a lower level the gross return from farms in Michigan advanced in a greater ratio than that from farms in Indiana, and in Illinois if for this state we exclude grain farms, which showed the greatest increase in the gross return in 1936-37. The smallest increase occurred on grain and livestock farms in Illinois; where but for the extra value of 380 dollars yielded by the sale of cereals the gross return in 1936-37 would have been lower than in 1935-36 (Table 1).

Harvests were good in 1937-38, but the prices of cereals and meat fell rapidly during the last five months of 1937. A great number of stockraisers who had bought animals at high prices suffered considerable losses. Except on grain farms in Indiana, which improved their position, the gross return fell sharply. The same thing would have been found in the case of farms in Illinois, had their accountancy results been available in time for the preparation of this article.

Let us glance once more at Table 1, where figures have been assembled relating to the gross return per farm and the index numbers of the gross return together with their components.

On grain farms and on grain and livestock farms the increase in the gross return was greater than on dairy farms. The vegetable produce of these last is more exposed to hazard and does not allow of farmers maintaining stock-raising and dairy production with full effectiveness. On farms in the second group stockraising is most satisfactory, and the gross return from this branch of production shows large increases from year to year. As for farms mainly producing cereal crops they combine harmoniously the three main branches of agriculture—dairy production, stockraising and crop production. The first is free from risk and the other two act as a complement to it. Thus in 1935-36 the lower value of vegetable produce was largely compensated by the increase in the gross returns from animals.

Farm Expenses, Working Expenses and Social Income.

A big reduction in farm expenses was effected in the first two or three years after 1932. The fall in returns after 1929 led American farmers to reduce expenses on their farms. This reduction related mainly to instruments of production, to which we have assigned the name working expenses. Up to 1937-38 there were no big fluctuations in labour expenses. Taxes, which had fallen from 1933-34 onwards, also tended to increase in 1937-38. There was a big reduction in farm expenses in 1933-34; from 1935-36 they begin to rise in proportions varying with the district and system of farming.

The increase in farm expenses from 1933 to 1936 was less than that in the gross return, while in 1937-38 the net return, in spite of a fall in the gross

TABLE II. — *Farm Expenses and their Components in Dollars per Farm and expressed as Index Numbers.*

State	Years	Labour costs	Taxes	Working expenses	Farm expenses
(a) <i>Dairy farms</i>					
Indiana	1932-33	254	59	1520	2163
		12	18	70	100
	1933-34	540	335	1334	1800
		16	15	53	84
	1934-35	244	276	1152	1672
		11	13	53	77
	1935-36	305	261	1275	1841
		14	12	59	85
	1936-37	310	270	1181	1701
		14	12	55	81
	1937-38	432	299	1524	2255
		20	14	70	104
Michigan	1932-33	676	146	1608	1830
		37	8	55	100
	1933-34	690	96	571	1366
		38	5	32	75
	1934-35	723	76	554	1353
		39	4	31	74
	1935-36	764	66	1147	1677
		42	3	63	108
	1936-37	921	65	1312	2328
		50	3	74	127
	1937-38	881	64	1536	2481
		48	3	85	136
Illinois	1932-33	983	370	1352	2655
		37	12	51	100
	1933-34	861	278	893	2032
		32	10	34	76
	1934-35	912	236	869	2017
		34	9	33	76
	1935-36	1142	250	1030	2431
		43	9	40	92
	1936-37	1207	270	1204	2690
		45	10	46	101
(b) <i>Grain and livestock farms</i>					
Indiana	1932-33	219	394	1438	2651
		11	19	70	100
	1933-34	208	232	1317	1757
		10	11	65	86
	1934-35	235	247	1182	1664
		11	12	58	81
	1935-36	327	242	1611	2180
		16	12	78	106
	1936-37	368	291	1666	2625
		18	14	96	128
	1936-38	399	291	2321	3011
		20	14	113	147

TABLE II (continued)

State	Years	Labour costs	Taxes	Working expenses	Farm expenses
(b) Grain and livestock farms (continued)					
Michigan	1932-33	572	194	846	1 012
		35	12	53	100
	1933-34	704	126	580	1 410
		44	8	36	88
	1934-35	735	104	624	1 463
		46	6	39	91
	1935-36	833	80	1 285	2 207
		52	5	80	137
	1936-37	1 004	79	1 521	2 604
		62	5	94	161
	1937-38	986	80	1 579	2 645
		61	5	98	164
Illinois	1932-33	505	87	753	1 905
		45	15	40	100
	1933-34	872	283	640	1 804
		46	15	34	95
	1934-35	925	240	850	2 021
		48	13	45	106
	1935-36	946	215	750	1 911
		50	11	39	100
	1936-37	1 037	245	844	2 126
		54	13	45	112
(c) Grain farms					
Indiana	1932-33	331	402	1 206	2 029
		16	20	64	100
	1933-34	217	174	813	1 204
		10	9	40	59
	1934-35	283	160	949	1 401
		14	8	47	69
	1935-36	390	215	1 560	2 165
		19	11	77	107
	1936-37	444	242	1 510	2 196
		22	12	74	108
	1937-38	636	367	1 893	2 896
		31	18	94	143
Michigan	1932-33	703	103	646	1 512
		46	11	43	100
	1933-34	682	116	581	1 379
		45	8	38	91
	1934-35	732	95	637	1 464
		48	7	42	97
	1935-36	804	84	915	1 803
		53	6	60	119
	1936-37	969	78	1,130	2,177
		64	5	75	144
	1937-38	977	77	1,295	2,349
		65	5	85	155

TABLE II (continued).

State	Years	Labour costs	Taxes	Working expenses	Farm expenses
(c) Grain farms (continued)					
Illinois	1932-33	804	400	774	2,077
		43	20	37	100
	1933-34	850	318	783	1,987
		41	17	38	96
	1934-35	908	295	805	2,008
		44	14	39	97
	1935-36	968	272	874	2,114
		47	13	42	102
	1936-37	1,100	310	1,013	2,438
		53	15	49	117

return, was well above the 1932-33 and 1933-34 figures (Diagram I). In 1932-33 the net return from farms in Michigan and Illinois had fallen below zero.

Social income followed the gross return in its upward movement, as also in its downward movement in 1937-38 (Diagram I). In 1933-34 on nearly all farms and in 1934-35 on grain and livestock farms in Indiana it recovered more rapidly than the gross return, this being due to a more rapid decline in farm expenses (Table II). In 1935-36 exactly the reverse occurred on grain farms in Indiana, Michigan and Illinois. As a result of too sharp a rise in farm expenses the social income lost ground and was unable to keep up with the gross return in its upward movement, and even declined. (Diagram I and Table II). In the following year it again rose, but in 1937-38 this upward trend was interrupted by the fall in prices and the increasingly rapid rise in working expenses.

The Farmer's Share in Social Income.

Great importance naturally attaches to the distribution of the social income from farms between farmers, workers and the State. The following table shows the share, expressed as a percentage, accruing to farmers in Indiana, Michigan and Illinois. The shares paid to workers and in taxes is easily found, and will be dealt with below.

The farmer's share doubled, trebled and even increased five-fold between 1932-33 and 1933-34. On grain farms in Illinois it was in 1933-34 actually sixteen times greater than in 1932-33. While in 1932-33 the farmer only obtained on the average a third of the social income, from 1934-35 to 1936-37 he kept nearly 90 per cent. of all returns from his farm. As we saw, wages and taxes fell and the net return increased greatly as a result of the rise in prices. In 1937-38 the fall in the prices of agricultural products had still not sensibly affected family farm earnings. The figures in Table III are a striking witness to the success of the United States Government's policy in the field of agriculture.

TABLE III. — *Family Farm Earnings as a Percentage of Social Income.*

	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38
Dairy farms:						
Indiana	38.11	75.70	75.85	81.11	84.05	78.74
Michigan	42.37	75.04	85.56	84.22	87.53	83.82
Illinois	39.75	70.42	83.36	81.09	83.20	
Livestock and grain farms:						
Indiana	32.32	70.16	80.37	87.13	87.68	81.23
Michigan	14.82	80.60	80.01	87.07	80.16	84.70
Illinois	25.66	78.30	83.38	84.06	81.31	
Grain farms						
Indiana	28.30	78.52	88.15	85.20	85.20	73.02
Michigan	17.24	84.00	87.74	87.86	90.70	85.51
Illinois	5.15	80.15	85.06	84.40	86.60	

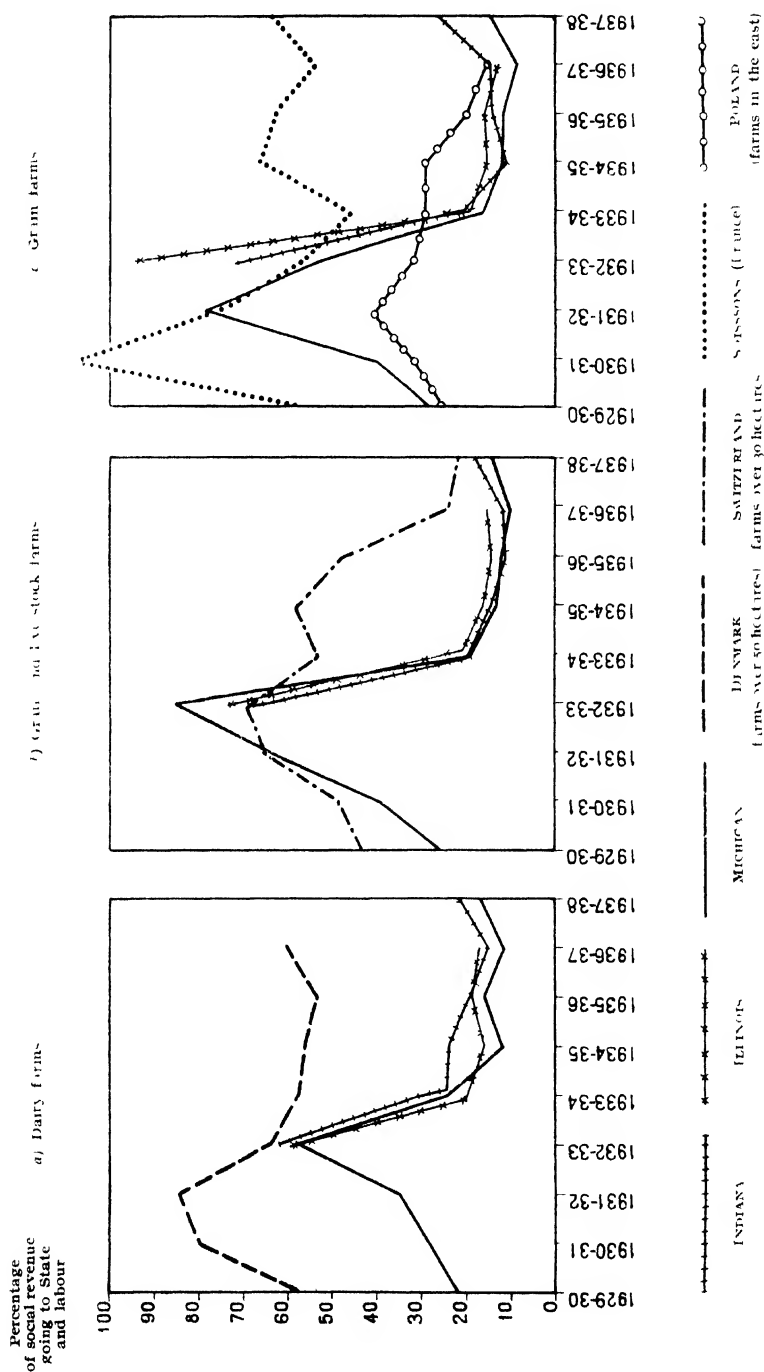
The Share of the Social Revenue accruing to Third Parties in the United States and in certain European Countries.

Variations by country and from one year to another show certain characteristic features. They show that intensive agriculture is very sensitive to crises in consequence of the large-scale employment of means of production produced outside the farm and the close dependence of these on the market. Agriculture is intensive in those countries where the part of the social income going to third parties is high and increases rapidly during periods of crisis. In Diagram II variations in this part of the social income from farms in Indiana, Michigan and Illinois are compared with the figures for similar farms in Europe.

The first point to be noted is that the figures for each of the groups of American farms differ very little from one another. During the crisis the share in the social income going to third parties increased greatly; when the crisis years had passed this fraction fell very low, representing no more than between 15 and 10 per cent. of the total. Conversely, the share accruing to farmers diminished considerably during the years of crisis and then rose so rapidly that it exceeded the level reached in 1929-30. This extraordinary recovery in the American farmer's position testifies to the very energetic measures taken by the United States Government to assist agriculture.

Of those chosen, the European farms most closely resembling the American farms as regards the distribution of social income are Swiss farms with an area of more than 30 hectares. It is true that the share in social revenue accruing to third parties did not increase in Switzerland in the same proportions as in the United States, but from 1935-36, as in the latter country, it fell to a very low level. Government intervention undoubtedly had something to do with this satisfactory development.

DIAGRAM II — *Share in the Social Revenue paid by the Farmer to Workers and the State,
in certain groups of American and European Farms.*



In Denmark and in the Soissons district in France agriculture is intensive and closely dependent on the market. The part of the social revenue paid by the farmer to workers, creditors and the State was high in 1929-30, reaching nearly 60 per cent. of the social income. It increased very rapidly in 1930-32. After the crisis it returned to its former position. The outlay on purchases of fertilizer, seed and fodders on Danish farms was as high as the wages bill, and represented more than 30 per cent. of farm expenses. Danish agriculture is, of course, highly industrialized and closely bound up with foreign trade. The farms in the Soissonais grow industrial crops, and attempt to obtain large yields from wheat and sugar beet. The outlay on purchases of fertilizer and seed rose to nearly 30 per cent. of farm expenses. In Switzerland on farms of more than 30 hectares this figure did not exceed 20 per cent. of farm expenses, and in the United States the proportion average 8-9 per cent. in Illinois, 15-20 per cent. in Michigan and 25 per cent. in Indiana.

In Poland, on farms in the east, the outlay on purchases of fertilizer, seed and fodder was hardly more than 5 per cent. of farm expenses. These farms offer a concrete instance of the variations during a troubled period in the part of the social income going to workers, creditors and the State in an area of intensive cultivation. Very small in normal times, the proportion only increases slightly in crisis years. Government intervention from 1934-35 had a satisfactory effect on the position of the peasant, his share increasing as that accruing to third parties was reduced.

In Denmark and the Soissonais the part going to third parties did not fall after the crisis in as great a proportion as in the United States, Switzerland and Poland. For in Denmark and the Soissonais agriculture has high costs of production which cannot be reduced and yields which it would be difficult to increase.

For completeness it would have to be seen to what extent government intervention took place, but this would take us too far. Intervention does not seem to have had the same effect on the development of social income as in the other countries examined.

Profit or Loss on Total Farm Assets.

These considerations lead us on to the problem of costs of production and the prices of agricultural products. The farmer's share in social income will be greater as the margin between agricultural prices and the prices of farm requisites is greater. The difference between the gross return and the costs of production (farm expenses plus interest on capital) has in agricultural economics been given the name of profit or loss on total farm assets.

In 1932-33, at the worst period of the crisis, the disparity between industrial and agricultural prices seems to have had as disagreeable consequences for United States as for European agriculture. In Michigan farm costs were actually 100 per cent. higher than the gross return. But Table IV shows that it was much more difficult for agriculture to recover in Europe than in the United States. The

TABLE IV. -- *Profit or Loss on Total Farm Assets as a Percentage of the Gross Return*

	1932-33	1933-34	1934-35	1935-36	1937-38	1938-39
Dairy farms						
Indiana	25.48	14.97	16.33	28.26	10.00	27.43
Michigan	97.91	20.56	16.13	6.78	16.31	2.31
Illinois	55.33	13.17	- 1.8	9.84	23.84	
Denmark farms of 50-100 ha	8.05	3.62	2.11	0.65	5.11	1.29
Livestock and grain farms						
Indiana	24.20	- 0.51	50.97	40.25	31.06	22.38
Michigan	114.45	- 3.03	9.03	15.27	- 1.55	3.91
Illinois	11.62	11.29	7.03	16.32	11.45	
Switzerland farms of more than 30 ha	31.51	10.77	- 8.7	13.01	5.21	0.34
Grain farms						
Indiana	22.28	27.91	46.34	30.30	41.61	- 0.97
Michigan	3.67	4.86	11.59	14.73	31.06	8.47
Illinois	19.40	13.85	8.07	12.01	5.62	
Sorssons (France)	8.60	11.21	0.20	5.41	13.39	6.04
Poland (farms in the east)	41.10	14.33	31.51	17.80	3.08	

losses of American farmers rapidly changed into profits which, like the social income, soon became substantial. There can be no doubt that United States farmers owe this privileged position to the intervention of the government, whose care it was to increase money receipts by such immediately effective measures as the Agricultural Adjustment payments.

J. DESJARDIS

INTERNATIONAL CHRONICLE OF AGRICULTURE

AUSTRALIA

While the recession which began in the autumn of 1937 was bound to affect Australia on account of the importance for her of international trade, internal conditions do not appear to have been seriously disturbed.

The level of industrial production, which has shown a tendency to rise in recent years, was maintained, assisted perhaps by the government's three-year armaments programme, announced at the end of 1938. The general index of wholesale prices ⁽¹⁾ (1911 = 100) rose slightly, from 164 in 1937-38 ⁽²⁾ to 169 in 1938-39, while only a small increase in unemployment was registered.

(1) Melbourne Wholesale Price Index Numbers.

(2) The Australian statistical year runs from July 1 to June 30.

The index ⁽¹⁾ for arable farming produce rose from 164 in 1937-38 to 191 in 1938-39 an increase which contrasts strangely with the downward trend in world prices of wheat, and which shows the degree of insulation achieved within Australia through government intervention. The indexes ⁽¹⁾ for dairy produce and meat rose 6 and 5 points respectively.

On the other hand the decline which occurred in the value of exports - from £A 139 million ⁽²⁾ in 1937-38 to £A. 120 million in 1938-39--was a serious loss for Australia, as it is on her export trade that the Dominion is largely dependent for her prosperity.

Although some 60 per cent. of Australia's population is concentrated in towns, exports are principally of agricultural products. About 70 per cent. of the value of all exports come under the categories of wheat and flour, wool, dairy produce, meat and fruit alone, of these products, again, wool and wheat are by far the most important, representing in 1937-38, for example, about 33.9 and 19.5 per cent respectively of the value of all exports.

The fall in the value of exports arose largely from the sharp decline in wheat prices and the smaller fall in wool prices on the world markets. Exports of meat and fruit both remained at about the same level as in the preceding year, while exports of dairy produce increased. The table below shows the value distribution of exports of the principal Australian agricultural products from 1936-37 to 1938-39.

Value of principal Agricultural Exports of Australia, 1936-37 to 1938-39
(£A. thousand)

Year	Wool	Wheat and flour	Butter and Cheese	Meat	Fruit (fresh, dried and preserved)	Total
1936-37	62,503	24,262	9,186	8,900	5,132	2,888
1937-38	46,983	26,939	11,626	10,642	6,101	1,027
1938-39	42,620	13,275	13,900	10,013	6,301	1,181

The average price received per bushel of wheat fell from 5s. $\frac{1}{2}$ d. in 1936-37 to 4s. 8d. in 1937-38 and to 2s. 9 $\frac{1}{2}$ d. in 1938-39. For the same three years unwashed wool prices fell from 1s. 4 $\frac{1}{2}$ d. to 1s. 2d. and to 11d. per pound respectively. While the fall in wool prices was offset to some extent by increased output, that in wheat prices was accompanied by a reduction in sales of some 32 million bushels in the 1938-39 season, which is attributable to the smaller output caused by severe droughts at the beginning of the season.

There were no spectacular rises in the prices of other commodities to compensate for the reduced receipts from wheat and wool. Prices of butter and cheese improved and the volume of exports increased, but the net gain over the preceding year was only of the order of £A 2,000,000. The slight increase in the value of fruit exports was mainly due to increased shipments of currants and fresh apples.

(1) Melbourne Wholesale Price Index Numbers.

(2) Throughout this article all values are expressed in terms of Australian currency.

External trade.

Australian foreign trade policy is mainly based on the tariff system, three different rates at which duties may be charged being distinguished: the Empire preferential rate, the intermediate rate, and the ordinary rate. In the case of certain countries these had been supplemented from May 1936 by an import licensing system. On December 7, 1937, however, the Commonwealth Government announced that quantitative restrictions would be abandoned, and by May 1938 the last of these had been removed. On December 1, 1939, owing to the need for economizing foreign funds brought about by the war, imports of a large number of commodities were again made subject to possession of import licences. The provisions do not at present apply to countries within the sterling bloc.

More than 50 per cent. of Australia's exports go to the *United Kingdom*, trade relations between the two countries being regulated on the basis of the Ottawa Agreements. These allow preferential tariff rates on goods traded between different parts of the Empire. Since these rates are not extended to foreign countries under the most-favoured-nation clause, they represent a very considerable advantage to the countries enjoying them, and form an explanation of the high level of imports from the Dominions into the United Kingdom. Part of the advantage accruing from these reduced tariffs was lost by Australia with the conclusion of the Anglo-American Trade Agreement at the end of 1938. The product most seriously affected was wheat, which had previously enjoyed the benefit of being freely importable into the United Kingdom, whereas on foreign wheat there had been a duty of 2s per quarter (about 8 bushels). The Anglo-American Agreement removed this duty in the case of American wheat. Other Australian agricultural products which may be affected by the agreement are rice, honey, fresh apples and pears, and preserved and dried fruits, for all of which the tariffs have been reduced on American imports into the United Kingdom.

A further measure affecting Australian trade with the United Kingdom was the announcement at the beginning of 1939 by the British Government of the introduction of quotas for meat imports from Empire countries. Imports in 1938 were taken as a basis, the quota being fixed at 3 per cent. less than this amount.

■ The country coming second in importance as a market for Australian produce is normally the *United States of America*. In 1936-37 this country took some £A. 19 million worth of Australian exports. Since then Australia's exports to the United States have fallen off, probably in part as a result of the Commonwealth Government's announcement of its trade diversion policy⁽¹⁾ which affected imports from the United States adversely and led the United States Government to retaliate by withdrawing the preferential treatment previously accorded to certain Australian exports. While exports to the United States decreased, however, there was actually an increase in imports from this country, and the trade balance which had been favourable for Australia in 1936-37 showed a large deficit in 1937-38 and 1938-39. Conversations are being held between Australia and the United States with a view to a trade treaty, but as American farmers are strongly opposed to Australia's being granted import facilities for her agricultural produce, and as a large part of Australia's imports from

(1) See *Monthly Bulletin of Agricultural Economics and Sociology*, August 1938, p. 391.

the United States could be dispensed with, it is unlikely that a treaty would lead to any substantial increase in trade

In December 1938 a trade agreement was concluded with *Switzerland*, by which in exchange for most-favoured-nation treatment and the application of the Australian intermediate tariffs to certain Swiss products, the Swiss Government agreed to reduce import duties on wool and to concede Australia larger import quotas for apples, pears, fine woods and barley.

In June 1938 a trade agreement was concluded with *Japan*. By the agreement Japan arranged to take 267,000 bales of wool, and approximately a further 100,000 bales which had not been imported in 1937-38 in accordance with an earlier agreement. Actual imports, however, had only reached 242,000 bales by June 1930, and in view of this the agreement was not renewed. Instead, however, Japan is understood voluntarily to have agreed to draw two-thirds of her total wool imports from Australia, and at the same time to limit her exports of piece goods to Australia to the maximum quantities of cotton, rayon and staple fibre specified in the expired agreement

In March 1938 a trade agreement was signed between Australia and *New Zealand*, the gist of which was mainly to increase import duties on Australian goods entering New Zealand. New Zealand did, however, agree to remove quantitative restrictions on imports, of citrus fruits from Australia

In April 1938 Australia and *Norway* decided to apply reciprocal most-favoured-nation treatment to the trade between the two countries. In the same month a *modus vivendi* was reached with *Brazil*, both countries granting most-favoured-nation treatment with the exception in the case of Australia of special privileges applying to Empire countries and in the case of Brazil of special privileges accorded to neighbouring countries

Measures relating to the production and marketing of agricultural products.

The principle of government intervention in marketing has been accepted longer in Australia than in most countries, and control is exercised in one form or another over a large number of products. Certain constitutional difficulties have, however, arisen which detract from the effectiveness of the Commonwealth Government's action. In 1930 the Judicial Committee of the Privy Council decided against the Commonwealth Government in a dispute as to the latter's power of control over marketing. The Privy Council's judgment on the James Case, as it is known, deprived the Commonwealth Government of the power to fix prices⁽¹⁾. A large number of measures of control was therefore invalidated and as a result much of marketing policy has been taken over by the State governments. In some cases, however, Commonwealth control was maintained on a voluntary basis

Dairy produce — The most important example of this voluntary control is represented by the dairy industry, which besides covering Australia's internal requirements of dairy produce, has an export surplus amounting to about half the Common-

(1) See: *Government Measures affecting Agricultural Prices*, 1936, No. 6, pp. 56-57, International Institute of Agriculture, Rome

wealth's total production. Thus of a total output of butter of 360 million pounds in 1936-37 and of 430 million in 1937-38, 174 million pounds and 197 million pounds respectively were exported.

Since 1933 the dairy industry had been regulated by complementary Commonwealth and State legislation with the co-operation of the Commonwealth Dairy Produce Equalization Company Limited, the object being to produce an internal price higher than the export price by means of a quota system and machinery for equalizing returns to producers. Prices were not fixed directly, the method employed being to restrict supplies sufficiently on the internal market to produce the desired increase in price. After the James decision, the Equalization Company in agreement with the State governments and butter manufacturers decided to maintain the regulation of the butter industry on a voluntary basis through the allocation of State quotas for butter production, and this policy appears to have worked successfully.

In November 1939 under the special conditions created by the war, it was announced that the Commonwealth Government would assume responsibility for the marketing of butter, cheese and eggs, the United Kingdom having agreed to take the whole of the export surpluses of these products, and Export Boards were accordingly set up by statute for each of these products.

Wheat. - The most important legislation dealing with marketing problems passed recently has been that connected with the wheat industry, which comes second only to the wool trade in importance for Australian agriculture, having a gross value which has varied in the last ten years between some £A. 25 million (1930-31) and £A. 40 million (1936-37). In the same period output has averaged about 160 million bushels, production varying between the peaks of 1930-31 and 1932-33 in both of which years the yield exceeded 214 million bushels and the 126 million bushels produced in 1929-30. In 1938-39 production was estimated at 154,427,000 bushels a fall of 32,828,000 bushels below the 1937-38 figure. The world prices of wheat also showed very wide variations, having moved in the last three years, for example, from an average of 5s. 2.7d. per bushel in 1936-37 to 4s. 5.1d. in 1937-38 and to 2s. 6.2d. in 1938-39. These changes in price are as serious for the industry as the fluctuations in production since on the average some three-quarters of the total output is normally exported. Moreover these price changes themselves have an undesirable effect on production. For in periods of high prices the area under wheat in Australia has tended to expand, mainly through the employment of land previously used as sheep runs. This expansion on the basis of prices above those which can be expected to obtain normally has meant the extension of wheat-growing to land not well suited for that purpose. The instability of the whole position was forcibly brought home in 1934, when wheat prices fell very low, and in that year a Royal Commission was appointed to investigate the position of the wheat industry as a whole. Conditions were found to be by no means reassuring, and the commission came to the conclusion that some form of subsidy to farmers would be required in view of the low prices.

In 1936 wheat prices became firmer, and rallied so well that the Commonwealth Government felt able to postpone action. It was therefore not until 1938, when prices again began to fall, that the problem of measures to be taken to stabilize the farmer's position again became a burning question.

Many suggestions were made, finally it was decided at a meeting of State Premiers and Ministers of Agriculture that an internal price for wheat for consumption within the Commonwealth (known as the home consumption price) should be fixed the funds to be provided by levies on wheat and flour.

In December 1938 the necessary legislation ⁽¹⁾ was passed in the Commonwealth and State Parliaments, a stabilized price being assured for that portion of the wheat output sold for home consumption ⁽²⁾.

The legislation deals with two cases—one, where the price of wheat is below the agreed "payable price" (as was the case when the acts were passed), the other where it is above this base price. The payable price was taken at 5s. 2d. per bushel of wheat free on rail at Williamstown, Victoria (as if for export).

In the first case, the price paid to farmers for wheat consumed internally is financed through an excise tax on flour milled for home consumption. This tax may not exceed £A 7 10s. per ton of flour, and is calculated on the basis of the payable price of 5s. 2d. per bushel.

The tax required to assure this price when the acts were passed was estimated at £A. 5 15s. per ton of flour, and this was the sum actually levied. The proceeds from the levy which, with the price of wheat at that time at 2s. 6d. per bushel, would yield about £A 4,000,000 per annum (difference between 5s. 2d., the payable price, and 2s. 6d., the price actually received, multiplied by 36,000,000 bushels ⁽³⁾) are paid into the Wheat Stabilization Fund. This fund is divided into three separate accounts—the Wheat Industry Special Account, the Wheat Tax Account and the balance remaining over from the fund after deducting the amounts credited to the other two accounts. The Wheat Tax Account only operates when the price of wheat rises above the fixed price, and will be dealt with below. The Special Account consists in a sum which may not exceed £A. 500,000 in any one year set aside for special purposes. In the 1938-39 season the sum was assigned for the relief of farmers suffering from low yields caused by the drought. In general, however, the account was intended to be used for transferring wheat growers from land unsuitable for the economic production of wheat, and for converting such land to other uses. This appears to be the first occasion on which a deliberate attempt has been made in Australia to restrict the production of a commodity. Although the sums involved are small, the measure is an important precedent, for in the past any attempts to restrict production has always met with strong opposition.

The balance of the Wheat Stabilization Fund is to be paid to the States in the same ratio as the ratio of their production to the total production of the Commonwealth. The States in their turn are to distribute the sums received to the farmer according to output, irrespective of whether the wheat was sold for export, feed or any other purpose. It should be noted that there is no guarantee that the farmers will receive any specified price, but it seems that the price received will be less than that corresponding to the fixed price of 5s. 2d. at port, since a deduction is made for the Special Fund as well as for administrative expenses.

It was further provided that during the first year of operation advances not exceeding £A. 2,000,000 might be made from the Consolidated Revenue Fund of the Commonwealth Government.

The case was also envisaged where the price of wheat should rise above the fixed price. If this occurs the Flour Tax gives place to a tax on all sales and exports

(1) Flour Tax (Wheat Industry Assistance) Assessment Act, 1938, No. 48; Flour Tax Act, 1938, No. 49; Flour Tax (Stocks) Act, 1938, No. 50; Flour Tax (Imports and Exports) Act, 1938, No. 51; Wheat Tax Act, 1938, No. 52; Wheat Industry Assistance Act, 1938, No. 53.

(2) According to Professor Copland, in the last ten years an average of about 36 million bushels were consumed internally out of a total wheat production of about 160 million bushels.

(3) See note (2) above.

of wheat, which will be adjusted to keep the price of wheat at the fixed level, but which may not exceed 1s. per bushel. Revenue from this tax is to be paid into the Wheat Tax Account, for payment to millers who would otherwise be exposed to losses since they may not sell flour above the fixed price. The actual fixing of prices comes under the jurisdiction of the States, which legislated accordingly.

An unusual feature of this scheme is the fact that it is the home consumers who pay for the support given to the industry. (The provisions relating to the case when the price of wheat rises above 5s. 2d. are not likely to be invoked very often. In the last ten years the export price of wheat has only once exceeded this level).

Criticisms of the scheme were made both by flour consumers and wheat producers. The former, as was perhaps to be expected, since they are bearing the whole burden of the cost of the scheme, complained of the increased cost of flour. The farmers, on the other hand, objected that the return received was below what they considered a fair price. This average return per bushel of wheat was of course well below the return per bushel of wheat for home consumption, since roughly only a quarter of the total output is retained for internal purposes, the balance being exported and earning only the ordinary world price.

Controversy continued into the summer of 1939, when the Commonwealth Government proposed a guaranteed price of 3s. 4d. for all wheat. This was to be financed through the flour tax and a sum of £ A. 3,500,000 contributed jointly by the Commonwealth and State Governments, the former to pay £ A. 2,000,000, and the States the rest. This plan fell through, however, largely owing to the opposition of the Government of Victoria, which maintained that the whole of the financial burden should devolve upon the Commonwealth. Another difficulty raised by this proposal was that it required an alteration of the Australian Constitution, a thing which in the past had been difficult to obtain.

At the outbreak of war the future of the wheat legislation was still obscure. The new situation produced by the war, however, led to the Commonwealth Government's announcing in November 1939 that it would take over complete control of the 1939-40 crop. An initial payment of 2s. per bushel was made to growers, but it is not yet known what further payments will be made.

Fruit. — Another Commonwealth measure of considerable importance passed in 1938 was the legislation dealing with the apple and pear industry, a relatively important branch of agriculture in Australia which has yielded an average output over the last five years of some 10 million bushels of apples and 2 million bushels of pears. Annual production was fairly constant, in common with the value, which for the last three years has remained at about £ A. 2,500,000. Exports represent about a third of the total production in volume and about a half of the value.

Quantities supplied to the home market are restricted in a way similar to that employed by the dairy industry. In the past this was done through the Apple and Pear Export Council, a voluntary organisation working in co-operation with the State governments. The 1938 legislation, however, provides for the replacement of this body by an Apple and Pear Export Board with statutory powers. The board is being set up at the request of growers' organizations, its functions being to make recommendations to the Minister of Agriculture as to the regulation of exports, methods of improving the quality of fruit for export, and the fixing of the percentages of the total crops to be exported. Small levies are charged to provide funds for publicity on both the internal and external markets.

The citrus fruit industry was assisted by the conclusion early in 1938 of a trade agreement with New Zealand, in which that country agreed to place no quantitative

restriction on imports of Australian oranges into New Zealand. Acting on representations made by the Australian Citrus Advisory Council, the Federal Government also agreed to grant a bounty on exports of citrus fruits to countries other than New Zealand. The Citrus Bounty Act, 1938 was therefore passed, providing for a bounty of 2s. per box on all citrus fruits exported in 1938, 1s. 6d. per box in 1939 and 1s. per box in 1940, after which it is intended to withdraw assistance from the industry.

Wool. — As already remarked, wool is Australia's most important single export commodity. In 1936-38, for example, out of a total production of about 1,023 million pounds, some 783 million pounds, or about 76 ½ per cent., were exported, while in the same year the total value of production was estimated at £A. 54 million. The organization of the industry is looked after by the Australian Wool Board. The board has now introduced a levy on all wool at 6d. per bale, to be used for publicity purposes. In November 1939 it was announced that the British Government would, for the duration of the war, take over all supplies of wool not required for consumption within Australia, the base price for the current season being fixed at 1s. 07½ d. per pound.

Meat. — The total value of meat production in Australia in 1937-38, the last year for which figures have been published, was estimated at nearly £A. 38 million, of which over £A. 10 million came from exports. The export trade is regulated by the Meat Export Board which was set up by statutory authority in 1936. The board, which is financed by a small levy on all meat, arranges for exports and advises the Federal Government on questions of quality, standard and grading.

At the end of September 1939 it was announced that the British Government would purchase all surplus supplies of meat in Australia, and contracts were concluded between the two governments covering the year October 1, 1939 to September 31, 1940.

Other products. — Both the *wine* and *tobacco* industries have been expanding in recent years, and the increase in production of the former has been giving rise to some alarm owing to the difficulty of finding adequate markets.

The tobacco industry has been assisted by regulations prescribing the minimum proportions of Australian tobacco which must be mixed with foreign tobacco. In September 1938 this proportion was raised from 13 to 15 per cent. for cut or manufactured tobacco and from 2 ½ to 3 per cent. for cigarettes. The industry also receives a direct grant from the Commonwealth of £A. 20,000 per annum which is used for research purposes. It is intended to reduce this sum gradually to £A. 10,000 in 1942-43.

A certain amount of *cotton* is grown in Queensland, production in the last ten years having averaged about 14,000,000 pounds, though the figures for separate years show wide fluctuations. At the beginning of 1938, owing to the fall in the world prices of cotton, the Commonwealth Government restored for the 1938 and 1939 seasons the full bounty of 4 ½d. per pound of cotton as provided in the 1934 Raw Cotton Bounty Act.

State marketing. — Partly as a result of the James decision, a large and increasing number of products are being brought under the control of separate States, usually through powers acquired from a general marketing act for primary products and after a referendum has been taken among the producers concerned.

Thus to take one example, in Victoria such diverse products as *maize*, *eggs*, *chicory* and *onions*, are now regulated by government marketing schemes, the essential feature in all cases being the maintenance of a price on the internal market higher than that received for exports. In Victoria such matters as grading, packing and the actual pro-

cess of marketing the product have generally been delegated to merchants approved by the marketing authority.

The most important case of control by a State, though in this case the co-operation of the Commonwealth Government was also required, is perhaps that of the Queensland *cane-sugar* industry which has since 1923 been supported by an embargo on imports of sugar into Australia and has now in addition an export quota under the International Sugar Agreement of 1937 of 400,000 metric tons. Control has been in operation since the Great War, but the principal measures now affecting the industry were passed subsequently. In 1923 the price assigned for sugar sold for consumption within Australia was raised, and this encouraged so rapid an expansion in production that the low returns yielded by exports were seriously reducing the "equalized" returns for all sugar. (By "equalized" is meant the average price paid to farmers on the basis of the proportion of total output consumed at home and the proportion exported). In 1929 therefore it was decided to restrict production, and this was done by limiting the production of each area to the highest output in any year between 1915 and 1929. Sugar produced in excess of this amount received only the export price, which was not sufficiently remunerative to make production profitable.

In November 1930 an act amending previous acts on this subject abolished the system by which fixed quotas were given for a period of years, and granted growers and mills the right to appeal for an alteration in their quotas, various criteria being taken into account in allotting these quotas. In particular it was intended that sufficient sugar should be produced both to cover internal requirements and to utilize the whole of the international export quota. The act also stipulated that the quotas should be allotted in such a way as to provide for the greatest possible employment of labour compatible with fair conditions as to wages, etc., and for the distribution of settlements along the coastal areas suitable for sugar-cane growing. This last provision is an interesting extension of the policy of encouraging the settlement and development of Northern Queensland through the expansion of sugar growing one of the principal considerations influencing the Commonwealth Government's legislation in favour of the sugar industry.

Soil Conservation. — In conclusion, mention should be made of the Soil Conservation Act passed in Western Australia in 1938. Soil erosion has reached serious proportions in the Commonwealth, and this departure is important not only in itself but also as a precedent likely to be followed by other States.

The act sets up a Soil Conservation Service under the Ministry of Public Works, its main functions being research into methods of soil conservation, the surveying and investigation of land, the drawing up of plans for soil conservation and erosion mitigation, and the supervision and the carrying into effect of such plans, after these have been approved by the Ministry.

In general the act relies upon the voluntary co-operation of land-owners, but in cases where soil erosion on a private owner's land might give rise to damage to other property compulsion may be applied.

The financing of a land conservation project may be assumed entirely by the State, or the land-owners may be called upon to contribute part of the cost. The Ministry decides whether and in what proportion land-owners must contribute, the latter then having right of appeal to the Land and Valuation Court.

An interesting feature of the act is the power given the State Governor to purchase or appropriate land for work to be carried out under the Ministry of Public Works. Such lands will then be vested in the Ministry, and may be leased out for a term not exceeding five years.

F. G. WIGGLESWORTH.

SWITZERLAND

The Swiss money market continued steady in 1939. Available funds remained high.

The cost of living general index number (1929 = 100) fell slightly in the first quarter of 1939, from 85 in January to 84 in February and March, but rose again to 85 in April, May, June, July and August. International events then led to increases in the prices of foodstuffs, fuels and clothes, shown by a rise in the general index to 86 in September, 87 in October, 88 in November and December, and 90 in January 1940. For 1938 as a whole the average of the general index was 85.

The index of wholesale prices (foodstuffs, raw materials and other industrial products) moved to 90 (1929 = 100) in January 1940. The movement of the wholesale index has been as follows since 1938: 1938, 76; January, February, March, April 1939, 75; May 1939, 76; June, July 1939, 75; August 1939, 76; September 1939, 83. Since the end of December 1938 the index of wholesale prices has risen 17.9 per cent.

In 1939 2,870 building permits fewer were supplied than in 1938. This represents a decline of 33.6 per cent. and was due to the war.

Industrial activity increased, particularly in the export branches the number of fully unemployed showed falls of 7,761 or 15 per cent. for the average of the period January to August, and, in consequence of the mobilization, of 32,263 or 58 per cent. for September to December, in comparison with the corresponding periods of 1938.

The figure for retail business was strongly affected in 1939 by world political events. The hoarding of provisions was expressed, some months before the outbreak of war, in the form of large increases in retail trade, particularly in foodstuffs, and later, in clothing and textile goods. The total figure exceeded that of the preceding year by 6.7 per cent.

In 1939 there were 597 declared bankruptcies and 147 approved settlements, against 832 and 181 respectively in 1938.

Imports amounted to 1,889 million francs and exports to 1,298 million francs in 1939, against 1,607 and 1,317 million respectively in 1938 ⁽¹⁾.

The Secretariat of the Swiss Peasants' Union estimated the gross return from Swiss agriculture in 1939-40 at 1,269 million francs, against a figure in the preceding year of some 1,296.5 million francs. This is a decline of about 2.1 per cent., and was due principally to the lower value of the gross returns from livestock and cereal-growing farms. The gross returns from potato-growing and viticulture were greater than in 1938-39. As the level of farm expenses is higher than in the preceding season, the net return from Swiss agriculture in 1939-40 will show a decline of between 40 and 50 million francs in comparison with 1938-39.

External trade.

Exports of dairy products — At the beginning of 1939 stocks of butter and cheese were unusually high. From January to August exports of hard cheese were slightly greater than in 1938. At the beginning of September, however they were completely suspended, and only after long and difficult negotiations could they gra-

⁽¹⁾ *La Vie économique*, No. 1 (January 1940).

dually be resumed. Below are given the quantities exported from January 1 to October 31 in the years 1936, 1937, 1938 and 1939:

	(Quintals)			
	1936	1937	1938	1939
Hard cheeses	131,377	116,307	153,850	134,984
Cheese in boxes	22,537	23,903	31,879	32,049
Condensed milk	16,141	47,021	50,574	55,005

For the marketing of Swiss products, the new conflict in Europe has brought about conditions entirely different from those produced by the 1914 war, when the countries still retained their financial capacity and purchasing power. In the present struggle although food requirements have increased in the belligerent countries, exports of Swiss cheese are impeded by transport difficulties, the increased cost of transport and higher insurance premiums.

An order issued on September 8, 1939 by the Federal Department of Public Economy authorizes the milk and dairy produce supply section of the Federal War Office for Food Supplies to examine demands for cheese exports. The only organizations authorized to draw up these demands are the Swiss Union for the Cheese Trade and the Federation of Swiss Producers of Cheese in Boxes.⁽¹⁾

From August 26, 1939 exports of a large number of commodities have been made subject to permits. The Import and Export Service, which replaces the former Import Service and forms part of the Department of Trade controls the issue of these permits.⁽²⁾

Livestock Exports. Exports of livestock rose from 4,939 head in 1938 to 7,811 in 1939, an increase of 58 per cent. The authorities made efforts to stimulate the sale of Swiss livestock abroad, and with this in view the Federal Department of Public Economy issued an order authorizing the federations of stockraising syndicates to grant subsidies to exporters of bulls, cows and heifers. These subsidies are by preference paid at times when supply is most plentiful. In agreement with the Department of Public Economy, the Agricultural Division fixes the quantity, both for each particular case and in general. The subsidies amount to between 20 and 25 per cent. of the purchase price as confirmed by the receipt, and must not exceed 280 francs per animal. Exporters of breeding bulls bought on the open market for direct export receive a special supplement. Cattle and goats for export, if properly loaded, are granted free carriage by rail to the frontier. All exports of livestock for which a subsidy has been requested are supervised. The federations of stockraising syndicates and the offices placed in charge of these operations also supervise quality and price. The Agricultural Division has a superior right of control.⁽³⁾

Import and export control. On September 22, 1939 the Federal Council brought imports of merchandise under State supervision.⁽⁴⁾

(1) *Recueil de lois fédérales*, No. 38 (September 13, 1939).

(2) *Recueil de lois fédérales*, No. 34 (August 29, 1939).

(3) *Recueil de lois fédérales*, No. 30 (August 9, 1939).

(4) *Recueil de lois fédérales*, No. 40 (September 27, 1939).

Import permits — A federal decree of August 25, 1939 orders the Swiss Co-operative Society for Cereals and Fodders to supply import permits for wheat and rye for milling to millowners who will be obliged by agreement to form at selected places within the country a permanent reserve of wheat rye and bread flour additional to the stocks ordered by the law of July 7 1932 on the wheat supply. The reserve is equal to the average quantity of flour marketed in the last five seasons (1)

Sales taxes and supplementary duties — A decree of the Federal Council dated July 19 1939 makes the following alterations to the decree of June 27, 1929 relative to the charging of supplementary duties on food fats and oils. The Swiss Co-operative Society for Cereals and Fodders and the imports section of the Department of Public Economy are ordered to charge supplements varying between 22 and 55 francs per quintal on food oils and fats and on raw materials used in their production. For all imports exceeding the quantities fixed by the Department of Public Economy these supplements are increased to between 30 and 75 francs per quintal according to the commodity (2)

On July 29 1939 the Federal Department of Public Economy made the following changes in the supplementary duties on fodder goods: bran 4.50 francs per quintal; maize for feed 5 francs; edible maize 2.50 francs; wheat for feed 8.50 francs; and denatured flour for livestock 0.50 francs (3)

On June 29 1939 an order of the Federal Department of Public Economy raised the supplementary duties on imported hay to 2 francs per quintal. On July 4 1939 a federal decree imposed a duty of 50 francs per 100 kilogrammes on apricots not imported under the special permit of the Federal Department of Public Economy (4)

Measures relating to the marketing of agricultural products.

Sale of livestock — To avoid the spread of foot-and-mouth disease fairs and livestock markets were suspended until the autumn of 1939. The impossibility of exporting livestock had unfortunate consequences for the autumn fairs. However, through the reduced costs of transport and the assistance of the marketing service for young animals the disposal of produce-yielding stock within the country proved easier than in 1938. Prices rose steadily as is shown by the following figures:

Average Cattle Prices

Prices per kilogramme live weight

	November 1938	March 1939	September 1939	November 1939
Young cows in lactation	1.45	1.49	1.52	1.58
Bearing heifers	1.38	1.40	1.42	1.51
Fat heifers prime quality	1.34	1.31	1.37	1.39
Fat cows prime quality	1.02	0.99	1.06	1.12
Fat calves prime quality	1.82	1.62	1.86	1.96
Fat pigs	1.58	1.53	1.63	1.83

(1) *Recueil de lois fédérales* No. 34 (August 21 1939)

(2) *Recueil de lois fédérales* No. 27 (July 19 1939)

(3) *Recueil de lois fédérales* No. 29 (August 2 1939)

(4) *Recueil de lois fédérales* No. 25 (July 5 1939)

Despite this slight rallying of prices the market for slaughter stock remained somewhat dull. At the beginning of the war the provisioning of the troops increased the demand for slaughter stock. The fat pig market remained very inactive until the end of August. In the last four months of the year, the supply having proved insufficient, recourse had to be made to imports to avoid too big an increase in price.

An order issued by the Federal Department of Public Economy on August 9, 1939, authorizes the Agricultural Division to pay subsidies to stockraising syndicates for bulls bought on the open market and, in exceptional circumstances, after the markets are over. The bulls must be the property of the stockraising syndicates. The subsidy is payable for bulls under two years of age the good origin of which has been attested by a pedigree and productivity certificate and by the metal mark. The subsidy amounts to 10 per cent of the selling price less 500 francs, and may not be under 125 francs or over 325 francs per bull. In the mountain districts it will be increased by 50 per cent. and may not be below 150 francs nor above 450 francs per bull. The subsidy for billy goats and rams may not fall below 15 francs nor exceed 35 francs per head, while in the mountain districts the lower limit is fixed at 22 50 francs and the upper at 50 francs.

The Confederation also assumes responsibility for 75 per cent of the cost of the internal transport of cattle, sheep and goats bought on the open markets of Thun, Rapperswil, Interlaken, Burgdorf, Oensingen and Lausanne, and 50 per cent of these costs if the animals are sold during peak periods of marketing. At certain times the government will employ subsidies towards reducing the cost of transporting slaughter sheep from the mountains ⁽¹⁾.

Milk prices — On November 1, 1939 it became possible to raise the price of milk to 20 centimes per kilogramme, as interested circles had been requesting since the autumn of 1938. The retail price for consumer's milk was not changed. The "crisis centime" paid by farmers to the guarantee fund was on November 1, 1939 lowered from 2 1/2 to 1 1/2 centimes per kilogramme (Federal decree, November 24, 1939) ⁽²⁾.

Milling, purchase and sale of bread flour. — An order issued by the Federal Department of Public Economy on August 29, 1939 regulates the purchase and sale of bread flour. Millers, wholesale flour merchants and dealers may not supply white, semi-white, and wholemeal flours, semolina, etc., other than to their regular customers, and only when the goods in question are to be used to cover normal requirements. They may not be sold to new customers without permission from the wheat administration. Wholesalers and dealers in flour must buy their flour from their normal suppliers. Purchases in excess of normal requirements are prohibited ⁽³⁾.

The milling of wheat, rye and spelt, and the use of milled products were the subject of a decree by the Federal Council on September 19, 1939. By this decree owners of commercial mills must produce from the milling of soft wheat, rye, spelt and mixtures of cereals a standardized bread flour, bolted to about 80 per cent. A maximum of 5 per cent. of white flour or semolina may be extracted from the milling.

An order of November 9, 1939 raises this figure to 10 per cent. ⁽⁴⁾.

⁽¹⁾ *Recueil de lois fédérales*, No. 30 (August 9, 1939).

⁽²⁾ *Recueil de lois fédérales*, No. 49 (November 29, 1939).

⁽³⁾ *Recueil de lois fédérales*, No. 35 (September 1, 1939).

⁽⁴⁾ *Recueil de lois fédérales*, No. 39 (September 20, 1939) and No. 47.

Fruit trade. — A decree issued by the Federal Council on September 1, 1939, authorizes the alcohol monopoly to impose quotas on or restrict the sale of spirits to the degree required by the interests of national defence and the supplying of indispensable enterprises ⁽¹⁾.

Two decrees of the Federal Council, issued on September 12, 1939 regulate the provisioning of the country with table and cooking fruits and the supply of and duties on spirits. The alcohol monopoly pays for stoned fruit brandy 1.60 francs per litre on 100 per cent. basis free on rail at the station of departure or at the place of delivery.

The Federal War Office for Food Supplies issued on September 15, 1939 an order by which the alcohol monopoly is assigned the direction and supervision, in agreement with the trade organizations, of the trade in and utilization of fruits. Only holders of permits are allowed to trade in fruit ⁽²⁾.

Potato trade. — By an order of September 11, 1939, issued by the Federal Department of Public Economy, the alcohol monopoly organizes and supervises the potato trade. Only persons or establishments who have received permission are authorized to buy potatoes from the producers for resale. The prices to be paid to producers for edible potatoes have been fixed until further notice at 11 to 15 francs per 100 kilogrammes according to the variety and quality ⁽³⁾.

Regulation of the sale of foodstuffs. — The purchase and sale of certain foodstuffs was prohibited on August 28, 1939 by an order issued by the Federal Department of Public Economy. The goods in question are sugar, rice, leguminosae (peas, beans and lentils), food pastes, products with oats, barley, wheaten flour and maize flour as a basis, edible fats, clarified butter (excluding fresh, table and cooking butter), frying and salad oils, and products of milled cereals. The sale by merchants and private establishments and the purchase by individuals and private establishments of these goods is only allowed if the persons are furnished with a "blue" ration card ⁽⁴⁾.

On October 17, 1939 a federal decree authorized the Federal Department of Public Economy to control the acquisition, production, storing, distribution, sale and purchase, processing and consumption of foodstuffs and fodders. The Department may take all measures judged necessary to raise the level of imports and production and to ensure delivery to merchants, to give an agreed direction to consumption and to impose upon consumption restrictions of a general nature, and to ration certain foodstuffs imported or produced in Switzerland ⁽⁵⁾.

Sugar, rice, food pastes, leguminosae, flour and semolina from breadmaking cereals or maize, including wheat flakes, products from oats and barley, edible fats, edible oils and clarified butter have been rationed since October 30, 1939 ⁽⁶⁾.

Regulation of prices. — To prevent an unjustified rise in the cost of living, facilitate the market's adjustment to the economic situation and ensure regular supplies to the market, the Department of Public Economy was authorized by a federal decree

⁽¹⁾ *Recueil de lois fédérales*, No. 35 (September 1, 1939).

⁽²⁾ *Recueil de lois fédérales*, No. 39 (September 20, 1939).

⁽³⁾ *Recueil de lois fédérales*, No. 38 (September 13, 1939).

⁽⁴⁾ *Recueil de lois fédérales*, No. 33 (August 29, 1939).

⁽⁵⁾ *Recueil de lois fédérales*, No. 43 (October 18, 1939).

⁽⁶⁾ *Recueil de lois fédérales*, No. 44 (October 20, 1939).

of September 1, 1939 to regulate the prices of goods, house rents and farm rents, rates and charges of every type except transport, which operates under a special concession, to stop all commercial transactions of a speculative nature (cornering, usury, profiteering, chain trading, etc.), and, if necessary, to prepare inventories of, confiscate or expropriate foods ⁽¹⁾

Provisioning of the country with indispensable goods — By the administrative order I b of the federal law of April 1, 1938 for ensuring the provisioning of the country with indispensable commodities, the directors of firms producing or trading in indispensable goods, must so order and direct their establishments as to preserve their productive or selling capacity even in time of economic blockade or war. For this purpose directors of firms must hold in reserve at least normal quantities of all products in which they deal, and also of raw and supplementary materials ⁽²⁾

Measures relating to agricultural production.

The year 1939 was one of heavy rainfall. The damp weather and lack of sunshine seriously affected the yield from crops and obstructed the work of preparing the soil. Hail storms were frequent. Fodders were plentiful but with a low nutritional content. The yield from cereals, which were affected by rusts, smuts and take-all, was between 20 and 30 per cent below that in 1938. The potato crop was very small and recourse had to be had to imports. Internal potato prices rose from 7-10 francs per quintal in 1938 to 12-15 francs in 1939. The fruit harvest was also very unsatisfactory and sold at high prices. The vine yield in French Switzerland, however, was good and justified the hopes placed on it at the beginning of the year.

Increase in pig population — On October 3, 1939 the Federal Council issued a decree authorizing pig breeders and fatteners to increase the number of their pigs beyond the fixed quota, on condition that they employed only home-produced fodders. Import duties on pigs of more than 60 kilogrammes live weight were reduced from 50 to 20 francs per head ⁽³⁾

Utilization of land — On October 20, 1939 the Federal Department of Public Economy was authorized, by a decree of the Federal Council, to regulate the utilization of cultivable lands. It may order farms to change over to a different branch of production and arrange for uncultivated land to be farmed ⁽⁴⁾

Social policy.

Workers' allowances. — A federal decree of December 20, 1939 regulates provisionally the payment of allowances for workers retained under arms. Those having a right to this allowance are mobilized persons who before being called upon for active service were bound by an engagement of public or private law, and persons who,

⁽¹⁾ *Recueil de lois fédérales*, No. 36 (September 5, 1939)

⁽²⁾ *Recueil de lois fédérales*, No. 31 (August 16, 1939).

⁽³⁾ *Recueil de lois fédérales*, No. 41 (August 4, 1939).

⁽⁴⁾ *Recueil de lois fédérales*, No. 44 (October 25, 1939).

though not employed at the time of entering upon active service, had been employed for a period of not less than 150 days during the preceding 12 months. The allowances amount to 2.90 francs for persons living in the country and 3.75 francs for those living in towns. A supplement is also paid for each child of from 1 to 1.80 francs according as they are domiciled in the country or town and whether it is the first child or not ⁽¹⁾.

J. DESLARZES

BIBLIOGRAPHY ON ECONOMIC AND SOCIOLOGICAL SUBJECTS

DEGON, MADELEINE: *Le crédit agricole*. Preface by Gaëtan Pirou, Professor of the Faculty of Law in the University of Paris. Work awarded a prize by the Académie des Sciences Morales et Politiques. Paris, Librairie du Recueil Sirey, 1939

The author opens with an historical introduction and then proceeds in the first part to a study of the nature, forms and origins of agricultural credit. Agricultural credit must be adapted to the characteristic features of agricultural production, to the slow rate at which working capital is reconstituted, to the uncertain nature of the return, to the scattered positions of the farms and to the fact that these must inevitably be remote from the money market. Credit co-operation combines the advantages of decentralized organization, a low rate of interest and a system of repayments which can easily be adjusted to the conditions of production. The less organized has credit co-operation been, the more actively has the State intervened in the field of agricultural credit. In the two succeeding parts the author describes in detail the organization of agricultural credit in various countries, concentrating in particular on France.

In face of the depression, agricultural credit policy in France did not differ greatly from that followed in the majority of European countries, being characterized by such features as the restriction of production credits in favour of sales credits, and the extension of social credit bringing with it the centralization of agricultural credit organizations to facilitate State control. It is pointed out that the development of agricultural credit in France, its post-war prosperity and the nature of the difficulties encountered during the depression all go to show that its existence depends in large measure upon the financial assistance which the public authorities are in a position to give.

The author hopes that agricultural credit policy will attempt to harmonize private, collective and public action.

G. C

GRIBAUDI, DINO. *Ambiente fisiogeografico ed ampiezza della proprietà terriera con particolare riguardo all'Italia*. Saggio di Geografia Agraria. Torino, G. B. Paravia & C., 1939, 264 pp.

This book is a study of the size of agricultural holdings in Italy in relation to climate, soil and geomorphology, with emphasis on the geological basis. As the author points out, much of the traditional treatment of problems of land tenure has tended to a somewhat abstract antithesis of large and small holdings. A concrete discussion on the basis of geographical reality, singularly free of bias towards any particular size of holding, is therefore very welcome, even though the author severely limits himself to the above-mentioned features of the landscape, natural or cultural.

⁽¹⁾ *Recueil de lois fédérales*, No. 52 (December 20, 1939)

Adopting the tripartite division of the Italian *catasto agrario* into Mountain, Hill, and Plain—the first two each making up two fifths of the total area and the last one fifth—Professor Gribaudo sets the prevailing size of farm unit and size of agricultural property in relation to the typical conditions.

The Mountain presents an upper zone of pasture and forest, in which collective systems, necessary for the conservation of the latter, have survived, and a lower zone, in which agriculture requires strenuous labour and the land has been greatly subdivided so that risks are partly met by wide dispersion of parcels.

The mountain lands of the Apennines have a much higher percentage under sown crops than the Italian slopes of the Alps. In the northern half of the Apennines the relatively great variety and interpenetration of geological and vegetal zones enables the holding to include within a more restricted radius a share of each of the more important land-use categories. The relief and climate of the southern half of the Apennines, on the other hand, favoured the dominance of the *latifondo* over large areas; deforestation, especially in Calabria and Sicily, reduced the naturally poor feed resources and forced the small holder to rely more on short-term leases of parcels from the *latifondo* and on share cropping.

Adopting a morphological definition of the hill lands, the author demonstrates how their geological youth, land forms and climate have favoured the cultivation of woody crops, especially vines—in themselves practically an index of the upper limit of the hill land—and drought-resisting cereals, with terracing or other systematization of the land. In size of private properties, as in proportion of area under sown crops, the hill lands of Northern and Central Italy are intermediate between Plain and Mountain. Variety of conditions and crops makes the Hill especially suitable for small-scale mixed cropping, with autonomy in food and fairly steady income, while the morphology and the edaphic and climatic conditions mean absorption of the farm family in the business of getting good unit-yields.

The chapters devoted to the Plain are naturally concerned mainly with the Padano-venetian plain, on which soils and plentiful irrigation water favour large holdings on much of the area. The author devotes considerable space to an analysis of the conditions in the irrigated and unirrigated sections, especially in Lombardy.

The limitations Professor Gribaudo has set himself by discussing only one aspect of agricultural geography, namely, size of holdings, and that only in relation to a restricted group of geographic factors, unfortunately do not always allow him to present a living picture of that interpenetration of land and people which is, as he recognizes in his preface, so intimate in Italy. As he indicates in his subtitle, however, the work is of a tentative character and as such is to be welcomed as an exploration in a field of study in which much survey work still remains to be done.

C. J. R.

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(* List of abbreviations: bihebdom. (biweekly); bimens. (twice monthly); bimestr. (every two months); déc. (every ten days); étr. (foreign price); fasc. (copy); hebdom. (weekly); int. (home price); irr. (irregular); mens. (monthly); no. (number); N. S. (new series); p. a. (per annum); q. (daily); sem. (half yearly); s. (series); trihebdom. (every three weeks); v. (volume); trim. (quarterly).

N. B. — Between brackets [] are given translations and explanatory notes not appearing in the title of the review.

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Prof. UGO PAPI, *Segretario generale dell'Istituto, Direttore responsabile.*

MONTHLY BULLETIN

OF

AGRICULTURAL ECONOMICS AND SOCIOLOGY

SOME REMARKS ON THE AGRICULTURAL ORGANIZATION OF THE TROPICAL COUNTRIES OF THE ANDES

(Conclusion)

SUMMARY VII *Effect of General Economic Conditions on Agriculture* — VIII *Principal Crops* — IX *Stockraising* — X *Future Prospects of Agriculture in the Andean Countries*

VII. — Effect of General Economic Conditions on Agriculture.

The most important crops for these countries are those supplying goods required for home consumption. Their importance which arises largely from natural factors such as the difficulties of transport, is enhanced by the protective measures taken by the governments. Thus these home-grown agricultural products are completely protected from foreign competition in the mountainous region and to a lesser extent also in the coastal areas through import duties and the high cost of transporting goods from abroad. Vegetal products consist mostly of wheat and wheat flour, barley, rice, potatoes and sometimes maize, and are sufficiently protected as also are the chief animal products.

The cost of living, which varies considerably from one place to another owing to differences in natural conditions, transport costs and standards of living, shows even wider divergences from one country to another on account of the substantial differences existing between the general economic conditions in each country. These conditions have a decisive effect on the cost of production of export goods.

Except in the low-lying eastern region and in some of the coastal districts the cost of living of the peasants of a given country is usually found to be lower in places situated nearer the markets than in places distant from them and in areas with a cool climate than in areas with a hot climate.

While the peasants' cost of living within each of these countries differs considerably from place to place—sometimes in the ratio of 1 to 4—these variations are even more marked between the five republics, rising to a ratio of 1 to 10 and over. With such wide differences in the cost of living within the same country it obviously becomes very difficult to draw up anything in the nature of a comparative scale indicating the differences in the cost of living for the peasants in each of the five republics considered as a whole.

It may, however, be said that in general the cost of living of the peasants tends to increase to a greater or lesser degree as one goes from Ecuador to Bo-

livia, from Peru to Colombia and from Colombia to Venezuela. In the last mentioned country the cost of living is indeed so high it would be difficult to find another tropical country where life is so expensive.

As regards the effects of the price level on agriculture, in the case of goods destined for home consumption a high level of prices would normally tend to encourage imports and thus react adversely on home production; but such unfavourable consequences can easily be avoided by increasing the duties on the imports of the competing foreign products. In the case of export goods, on the other hand, the evils of high prices can only be met by recourse to the reduction or abolition of internal taxes and to the lowering of freight rates; should these measures prove insufficient to prevent farmers from neglecting export crops, the only remaining remedy is to establish export prices such as not only enable farmers to avoid losses but also offer them a small profit. This policy has been adopted for some years now in Venezuela to prevent the complete disappearance of the coffee and cacao plantations.

Exports from Bolivia consist almost entirely and from Venezuela mainly of mineral products. The two countries also resemble one another in having a favourable balance of payments, although Bolivia's balance is less great than Venezuela's as Bolivia is burdened with a large foreign debt and her currency is greatly devaluated. Bolivia's position is also less happy than Venezuela's in that the government revenue is lower than in Venezuela and the standard of living among the Bolivian workers and peasants, mostly Indians, is much below that of the Venezuelan workers and peasants. As regards agricultural exports, these in the case of Bolivia are limited to coca leaves sent to Argentina for consumption in the frontier provinces where the high cost of transport prevents competition from Peruvian coca leaves.

Venezuela, on the other hand, has a very favourable balance of payments, her currency has maintained its gold value, fiscal revenues are very high because of the petrol tax, there is no national debt, the standard of living among the peasants is much higher and there are only a few inhabitants of Indian race. Coffee and cacao, although they only represent a small percentage of total Venezuelan exports, are nevertheless of considerable value in proportion to the total agricultural output of the country, so that if these two exports were to be eliminated the national economy would certainly be seriously affected. Venezuela's cacao and coffee have, of course, to compete on the world market with those of other countries better suited by nature for the production of such crops.

The value of Peru's mineral and agricultural exports is well-balanced, the cost of living is not excessive, and the natural conditions on the coast are very favourable to the cultivation of cotton and sugar cane. These two products are indeed cultivated for export almost exclusively in the coastal region, where very progressive methods of farming have been adopted, with the result that very high yields and crops of excellent quality are obtained.

In Ecuador agricultural products represent over 50 per cent. of the country's exports. Fifteen years ago cacao alone provided over 50 per cent. of the total exports, but as a result of "witches' brooms", production has fallen off and the average exports for the six years from 1932 to 1937 reached only half

this figure, the situation being, of course, aggravated by the world economic crisis. The devaluation of the currency and the reduced purchasing power of the inhabitants have lowered the standard of living and reduced the cost of production of home-produced goods.

In Colombia coffee planting has made rapid progress and during the past 25 years this product has been the principal item of export, representing 72.9 per cent. of total exports in 1933. Although coffee exports have been steadily increasing in quantity their percentage in the total value of exports has declined slightly in recent years owing to the increased exports of petroleum and gold. Even so, however, coffee remains the predominant item in Colombian trade. It has been observed that the price of coffee and the quantity exported have a decisive effect on the selling price of national products within the home market to such an extent that about 90 per cent. of the cost of living in Colombia is based on the price of coffee. This connection between the cost of living and the price of coffee tends to reduce the cost of production of this product almost in proportion to the fall in the market price, with results very favourable to the producers and to the future prospects of this crop.

It should also be noted that the gold value of the Colombian currency has dropped to about the same extent as the selling price of coffee, while its purchasing power within the country has remained practically unchanged. This factor is very important, even if one takes account of the recent trade depression which also, although only to a slight extent, produced the same monetary phenomenon.

There is, nevertheless, something precarious in a situation where both home and foreign trade are so largely dependent on the output and price of a single agricultural commodity, the production of which may at any time be largely wiped out by the appearance of some unexpected or incurable disease. That such a danger is by no means purely imaginary is shown by the case of the cacao plantations in Ecuador which have been seriously damaged by "witches' brooms" and by the story of *arabica* coffee in Asia, where almost all the plantations disappeared at the end of last century owing to the invasion of *Hemileia vastatrix*.

There remains to be considered another point of a more general character, namely that as regards the exporting of agricultural produce the tropical countries of the Andes stand at a disadvantage relative to most tropical countries outside the Americas in that the costs of production in the former are higher. The reasons for this are:—

(a) The higher cost of undertaking any enterprise, owing to the very high rates of interest resulting from the shortage of capital, and to the rates of wages, which, although low enough in themselves, are yet superior to those paid in most other tropical countries.

(b) The higher freight rates due to the mountainous territory traversed and to the fact that some of the farming areas are at a great distance from the sea.

(c) The lack of home markets where a part of the exportable products can be sold under the protection of customs tariffs. Such a guaranteed market

often provides a very useful basis of sure profit and to some extent serves in place of an export bonus, the profits derived from the home markets making it possible and even profitable for producers to sell their goods on foreign markets at prices, if necessary, even below their costs of production.

This explains to some extent why the tropical countries in the Andes are unable to export a greater variety and larger quantities of tropical agricultural products.

In order to compete on the world market with products from the tropical colonies, agricultural exports from the Andean countries must be confined to:

(a) products which can be obtained under advantageous ecological conditions as regards both quality and quantity, *e. g.* coffee in Colombia, cotton and sugar in Peru,

(b) perishable foodstuffs which, in view of the short distance separating the place of cultivation from the consumers' market, can be put on these markets in excellent condition *e. g.* bananas from Colombia and Ecuador.

VIII. — Principal Crops.

Cereals. — With the exception of small quantities of rice exported from Ecuador, the cereals produced are used exclusively for home consumption. Indeed all five republics import wheat and wheat flour and barley, and except for Ecuador all import rice. The cereals other than maize are each protected by fairly high tariffs, but a large percentage of imported cereals is consumed in the regions along the coast and navigable rivers in the lower eastern area, owing to the distance from the centres of home production.

As in the case of other crops exact up-to-date statistics for cereals are lacking on account of the absence of adequate land surveys. It may, however, be said that at least one third of the cultivated area, not including grazing land, is sown to cereal crops and their relative importance may also be judged.

Maize is the only cereal indigenous to the country. It can be cultivated even at an altitude of 3,000 metres provided there be no risk of frost, and is certainly the cereal most widely grown and most generally used in human diet, not to speak of its use for feeding livestock, and especially pigs and poultry.

Maize cannot be kept for long in the hot and temperate areas as it is liable to damage by weevils, but it can easily be obtained all the year round from other regions where, owing to the variations in climate, the harvest occurs at different periods.

Some *wheat* is grown in all parts of the cold region with average rain-fall and in the arid and semi-arid regions, but in the last-mentioned areas irrigation is almost always used; this crop grows best where the average temperature lies between 14° and 18° C.

The yield per hectare is low and varies much from year to year. There are several reasons for this, but the main one is that the crop is liable to attack from various types of rust; furthermore the quality is very variable, especially that of soft wheats. Output is almost always lower than demand and the five republics all import this cereal.

All that has been said in connection with wheat applies also to *barley*, but the area sown to the latter crop is smaller.

Rice, which is much more widely used as a foodstuff by the inhabitants of the hot and temperate areas than wheat and wheat products, is only grown in regions where the average temperature does not fall below 21° C, principally along the coast. The yield is satisfactory and the crop, except in the case of mountain rice, can be grown fairly successfully throughout the whole year, although it is sought to bring in the harvest during the driest and hottest periods. Rice is cultivated as a perennial in Colombia in the hot and rainy region known as the "Valle del Cauca". An average of five crops is obtained every two years in this area, without resowing or ploughing; and no attempt is made to make harvesting coincide with the dry season. The second crop is often more abundant than the first.

The rice yield per hectare is very variable but as a rule satisfactory, although lower than that obtained in countries where conditions are more favourable.

Legumes are grown practically everywhere for human consumption, but almost always in small quantities. The most extensively cultivated, in order of importance, are: broad beans grown in the cold regions, French beans grown everywhere as long as there is no danger of white frosts, peas in the temperate region; lentils and chick peas wherever the average temperature is between 16° and 20° C.

Tubers. — The tubers most widely grown and consumed are the potato among the inhabitants of the cold regions and manioc among the inhabitants of the temperate and hot regions.

Potatoes can be quite successfully grown in the hot and temperate areas, but the areas of greatest production are the cold or very cold regions, generally, however, excluding districts subject to frequent frosts. The crop is particularly important in those regions where it is too cold for the cultivation of maize. However, frosts in the very cold regions and mildew in the more temperate areas often damage or even destroy the potato crop, and sometimes both frost and mildew attack the crop in the same place.

Except in the low-lying parts of the eastern region, the sweet varieties of *manioc* are preferred. The plant is grown in the hot and temperate areas and, as it does not require much rain, a satisfactory output can be obtained without irrigation; manioc can be left in the ground for several months after it is fully ripe. The starch obtained from this tuber is used for human consumption and, very occasionally, for industrial purposes.

Other tubers cultivated are the "ulluco" (*Ullucus tuberosus* Caldas) and the "oca" (*Oxalis tuberosa* Molina) in the regions with an average temperature varying between 10° and 14° C., and the "arracacha" (*Arracacha xanthorrhiza* Bancr.) which is extensively cultivated in Colombia in areas with an average temperature varying between 14° and 20° C.

The sweet potato (*Ipomoea batatas* Lamk) is widely grown in the hot and temperate regions, while yams are grown in the hot regions.

Tubers belonging to the Aroideae family, *Colocasia* and *Xanthosoma* species, as well as other more uncommon varieties, are grown in the regions of heavy rainfall.

As their nutritive value is small and they are not worth the payment of heavy freight rates these tubers are all consumed in the producing country at a short distance from the centre of production.

Quinoa. — “Quinoa” (*Chenopodium quinoa* Wild) is frequently grown by the peasants in the cold regions of Bolivia, Peru, and Ecuador and in the department of Nariño in Southern Colombia.

Bananas. — The banana is cultivated throughout the hot and temperate regions, and one rarely comes across a farm or even some wretched hut surrounded by a small piece of land which does not boast a few banana trees. The most widely cultivated variety is the *Musa paradisiaca*. When picked before it is ripe, the fruit is cooked; sometimes the fruit is eaten fried, and in this case the bananas are gathered when almost ripe and allowed to finish ripening in some place sheltered from the rain. — The *Musa sapientum* is eaten raw or fried when already ripe, but is not so widely grown for home consumption; it is, however, the only species grown for export, the “Gros Michel” variety being the favourite. The *Musa cavendishii* Lam is also cultivated but over a much smaller area. *Musa paradisiaca* and *Musa sapientum* are also planted for temporary and even for permanent shade on the cacao and coffee plantations.

Bananas have been grown in the department of Magdalena near the port of Santa Marta for some thirty years; as the rainfall is insufficient the plantations are always irrigated. This crop, which showed very marked progress at the outset, is now going through a period of stagnation which may last a long time.

About ten years ago Ecuador began to export bananas grown along her coast to Peru, Chile and even to the Pacific coast of the United States of America.

Average Annual Banana Exports from Colombia and Ecuador.

(Hundred metric tons)

	Colombia	Ecuador
1928-32	1,822	131
1933-37	1,500	247 (no figures for 1937)
1938	1,959	—

Sugar cane. — Sugar cane is widely cultivated in the hot and temperate regions, both for sugar manufacture and for the preparation of alcoholic drinks; it is also used, but on a much smaller scale, for fodder and for the extraction of fuel alcohol.

Exports of sugar from Venezuela, Colombia and Ecuador, previously small and showing wide fluctuations from year to year, have now practically ceased owing to the unfavourable conditions ruling on the sugar market.

Peru continues to export most of the sugar produced along the coastal region, but the area planted has been much reduced during the past few years,

sugar being often replaced by cotton and rice. However, sugar is still of importance in the departments of Lambayeque and La Libertad where half the cultivated area is under sugar cane; the output of these two departments indeed represents more than 80 per cent. of the total output of the country, the yield amounting to over 10 metric tons per hectare.

Average Annual Sugar Exports from Peru.

(Hundred metric tons)

1928-32	3,322
1933-37	3,289
1938	2,494

In all these countries from 5 to 15 cuttings are obtained as a rule; and except in the areas of average rainfall lying between Lat. 5° N. and Lat. 13° S., the crop can be cut at any time of the year, although the dry season is the best period.

Hitherto brown sugar has been preferred for home consumption, being sold in various shapes weighing anything from a few hundred grammes to several kilogrammes; now, however, the inhabitants are gradually coming to prefer white sugar.

A large number of small plantations produce only brown sugar and some of them have had to stop planting sugar cane; it seems unlikely, however, that white sugar will completely replace brown sugar even in the distant future.

Coffee. — The agricultural product supplying the greatest volume of exports is coffee. It is cultivated in the region of heavy rainfall, where the climate is hot or temperate, but an average annual temperature under 23° C. is necessary if the crop is to be plentiful and in particular if the quality is to be good.

It is not possible to state the maximum and minimum quantities of rain required annually for the coffee crop, because there are other important factors affecting the growth of this plant, such as soil, gradient, humidity, average temperature and the distribution of the rainfall through the year. If the dry season lasts more than 5 months, which is not uncommon north of Lat. 6° N., the crop will certainly be well below the average; this is the most usual cause of the variations occurring from year to year in the Venezuelan coffee crop.

Excessive rains may affect the crop unfavourably as they encourage fungus diseases; fertilization of the flowers also becomes more difficult and the branches become covered with moss and lichen.

All the coffee plants grown in these countries belong to the *arabica* species, since the climatic conditions are suitable (especially where the average temperature is below 23° C.) for the production of the quality called "suave" or sweet. This is the type of coffee most in demand on world markets today; it must be very carefully prepared for sale and, above all, the cherries must be quite ripe before being picked.

The possibility of producing a high grade coffee has been the chief factor contributing to the steady expansion of coffee cultivation in Colombia:

*Average Annual Coffee Exports
from Venezuela, Colombia, Ecuador and Peru.*

(Thousands of 60 kg sacks)

	Venezuela	Colombia	Ecuador	Peru
1920-25	821	1,963	76	1 6
1926-31	833	2,740	128	15 9
1932-37	794	3,572	193	46 3
1938	655	4,229	228	41 0

Venezuelan coffee exports, after remaining stationary for about fifty years, are now showing signs of falling off as the above figures show. At the same time Colombia, which fifty years ago did not export even a third of the quantity exported by Venezuela, came to export more than the latter about twenty years ago, and during the past three years (1936 to 1939) she has been exporting four times as much coffee as Venezuela.

The principal reasons governing these different trends in the coffee exports of these two countries whose climates are equally favourable to the production of high grade coffee are as follows:—

(a) All the Venezuelan coffee-producing regions are near the sea and transport facilities towards foreign markets have for long been excellent. The Colombian coffee-producing areas, on the other hand, are situated further from the sea—except for the Cucuta district on the Venezuelan frontier—and as navigation on the Magdalena was very costly fifty years ago, no railway and no road for wheeled traffic existed on the Pacific side, and the Panama Canal had not been built, it was impossible to export coffee on profitable terms. Conditions altered completely though gradually as a result of improvements in steam navigation on the Magdalena, the opening of the Panama Canal, and the construction of railways and roads for vehicles in the country itself.

(b) The area of land suitable for the production of coffee in Colombia is ten times larger than in Venezuela, and since the latter has been growing coffee in fairly large quantities for a long time, there is now little new land available for this crop.

(c) Until the end of last century the coffee produced in Colombia was grown as a rule on plantations with over 20,000 trees and employing paid workers. Conditions have now altered and the census taken in 1932 by the "Federación Nacional de Cafeteros" shows that out of 149,348 plantations only 2,871 contained over 20,000 trees. Since then the percentage of small plantations has probably increased still further, and more than half the coffee at present produced in Colombia is grown by small-holders employing only members of the family for the preparation of the land, while even children are employed for picking the coffee, which is the most expensive part of the work

as only ripe cherries are picked. The small coffee planter grows other crops as well, either for his own food or for sale. These factors have together led to a noticeable reduction in the cost of producing coffee in Colombia. In Venezuela, on the other hand, most of the coffee is produced on plantations with over 20,000 trees.

(d) In the main Colombian coffee sells at a higher price as it is prepared by the wet method, while most of the Venezuelan coffee is prepared by the dry method. The Venezuelan Government has started a campaign to stimulate the general adoption of the former method.

(e) The falling-off in the Venezuelan coffee output is due not only to the above causes but also—and perhaps indeed principally—to the extremely high cost of production resulting from the high cost of living, the reasons for which have already been explained. To prevent coffee and cocoa cultivation from being neglected, the government has been compelled to offer large bonuses for exports of these two products; and a sum of 22 bolivars, *i. e.* 8 7.10 (U. S. A.), per quintal of 46 kilogrammes of coffee, equivalent to almost three-quarters of the sale price of the Venezuelan product on the world market, is paid. The government has also appropriated the sum of 5 million bolivars to be used for making loans to planters lacking credit.

Coffee exports from Ecuador have almost tripled during the past 15 years, this would appear to be due to the decrease in the cacao crop which has fallen off rapidly since 1923, and which was reduced by over one half in the space of three years through the “witches’ brooms” disease. Most of the coffee plantations in this country either border on, or are combined with the cacao plantations, and cacao producers have consequently increased their coffee output, or have started growing this crop in addition to cacao, in order thus to balance their budgets and cover the heavy deficits resulting from the loss of more than half their cacao crop.

Ecuador’s exports of coffee are sold on the world market at much the same average price as Rio No. 7. The coffee for export is grown in the hot region (average temperature 25° C.); it is picked in the same way as in Brazil, *i. e.* without selecting the ripe cherries, and is prepared by the dry method. In spite of this coffee growing is still profitable in Ecuador, due to the low cost price which is the result partly of the methods adopted for picking and preparation but mainly of the low cost of living.

Although fifteen years ago Peru exported only a few thousand sacks of coffee from 1936 to 1938 an annual average of 45,000 sacks was exported. It would appear that the increase in output is due in part to the decrease in coca exports, which induced producers to turn to coffee growing, since the most important centres for producing this crop are those where coca is grown.

Bolivia also grows coffee in the coca area, but only for home consumption, since the cost of transport is too high to make this product a profitable export item; very small quantities are, however, exported to the northern provinces of Argentina.

Cacao. — Colombia, Peru and Bolivia all grow a certain amount of cacao, but the quantities produced are not sufficient to meet internal requirements.

Average Annual Cacao Exports from Venezuela and Ecuador.
(Hundred metric tons)

	Venezuela	Ecuador
1908-13	158	311 (5 years)
1914-19	183	422
1920-25	205	386
1926-31	175	202
1932-37	159	177
1938	—	184

Venezuela has for long been exporting this product, the trend of the exports having been much the same as that of coffee—stationary for a long period followed by a slight decline in recent years and for the same reasons.

As has already been said, exports from Ecuador fell off rapidly as a result of attacks by the “witches’ brooms”, which has caused and is still causing serious damage. No means of combating this disease has as yet been found.

Coca. — Most of the inhabitants of the Indian race are accustomed to chew coca leaves which they mix with lime, ashes, honey and other condiments. They find that the alkaloid extracted from chewing coca leaves mixed with lime or ashes acts as a stimulant and also as a means of satisfying hunger. Thus coca chewers only eat twice a day, about seven in the morning and the same time in the evening; they chew coca leaves three or four times during the day.

The climatic conditions required for growing coca are similar to those required for the coffee crop, and as a rule plantations of the two products are found side by side.

Colombia and Ecuador produce sufficient quantities of this product to satisfy their own requirements, whilst Peru and Bolivia are exporters. In the last two countries it is cultivated on the mountain slopes at an altitude varying between about 1,000 and 2,000 metres and in regions where the annual rainfall is not less than 1,000 mm.

Most of the exports of coca leaves from Bolivia go to the northern provinces of Argentina, where the Indians and half-breeds use them for chewing; the average annual volume of exports has not altered much over a long period and amounted to 383,561 kilogrammes during the period from 1936 to 1938

Peru exports both coca leaves and raw cocaine to Europe and the United States of America. The maximum volume was registered in 1903 when 943 tons of leaves and 7,800 kilogrammes of raw cocaine were exported; but since then exports have fallen off steadily, except quite recently, as may be seen from the following table:—

Average Annual Exports of Coca Products from Peru.

	Leaves (Metric tons)	Raw cocaine (Kilogrammes)
1904-908	934	6,292
1909-13	585	4,487
1914-18	346	1,914
1919-23	248	672
1924-28	146	848
1929-33	112	381 (no figures for 1930)
1934-38	160,	607

The decline in exports is attributable in the first place to competition from the Netherlands Indies where labour is more plentiful and cheaper, and transport less expensive, and in the second place to the legislative measures adopted in most countries to prevent the abuse of cocaine.

Textile plants. — The two textile plants of real importance from the economic standpoint in these countries are cotton and “cabuya”, which is the name given to various species of agaves and *furcraeae*.

Peru has the largest cotton crop and exports a certain amount of this product; next in importance comes Ecuador with an output covering home requirements, while Colombia, Venezuela and Bolivia are all importers of cotton.

Most of the cotton is produced in regions where the average temperature does not fall below 19° C., and where the dry season can be relied upon with some degree of certainty.

Peru produces one of the world's finest cottons in the irrigable areas along the coast and especially in the Lima and Ica valleys.

Two or three crops are obtained per annum owing to the favourable climate and absence of insects capable of causing serious damage to plants.

In Northern Peru less cotton is grown and the “arrebatiado” (*Dysdercus ruficollis*) does a great deal of damage and annual cotton has to be cultivated.

The area sown to cotton amounted to 55,635 hectares in 1916, but increased to 104,287 hectares by 1920, and reached 162,088 hectares in 1935, since when it has remained almost stationary. Except for a small quantity used in the country itself, the whole output is exported; the average volume of exports for the period 1935-1938 was 77,000 metric tons.

Most of the seeds are exported, but Peru has now begun the work of oil extraction herself and this industry is likely to grow rapidly.

“Cabuya” is found as a woodland or hedge plant and is also grown in plantations with several thousands of plants. Cultivation of the “cabuya” plant has assumed considerable importance in Colombia, where it is used for the manufacture of sacks to the number of nearly 5 million for exporting coffee (a double sack is sometimes used), all the sacks for farm products, all the rope and string used in the country, all the material used in the manufacture of “espadrillas” (a type of shoe with string soles in general use by the Colombian peasants), and for the preparation of fibres for other purposes of secondary importance.

“Cabuya” fibre seems to be of better quality and more abundant when grown in regions where the average temperature is between 16° and 23° C.; the fibre yield is between 3 and 4 per cent. and a plant produces between 250 and 800 leaves during its life time, which varies according to the variety, climate and fibre by soil.

The fibre is generally removed from the leaves by hand; the work is hard and not very profitable as it takes a worker an hour to produce about 1 kilogramme of fibre. Large plantations with more than 10,000 plants remove the machinery.

Within a few years there is every likelihood that “cabuya” fibre will become an export article, at least in Colombia.

Tobacco. — The output of tobacco is sufficient for home consumption in all the tropical countries of the Andes. This product is cultivated in regions with an average temperature of at least 20° C., and is grown chiefly by small farmers.

IX — Stockbreeding.

Before the Spanish conquest the only livestock existing were llamas and alpacas.

The Spaniards imported all types of livestock from Europe, and these animals multiplied with varying rapidity throughout these countries so that stockbreeding is now much more developed than arable farming. This is due to the extensive type of stockraising practised, the scarcity of inhabitants, and the fact that transport difficulties affect stockbreeding enterprises less than arable farms, because livestock move by its own power, while plant products have to be carried, incurring expenses which increase in proportion to the distance covered, the cost eventually becoming prohibitive.

In all districts livestock are raised in the open; stalls for milch cows are, however, to be found in the neighbourhood of the larger towns in the cold and temperate zones.

Grazing lands are both natural and artificial; in the hot zone the latter consist mostly of *Panicum barbinode*, in cool areas and on lands which can be left under water for some time *Panicum maximum* is sown, meadows in the temperate zones consist of *Melinis minutiflora* and "pasto micay" (*Axonopus scoparius* Fluegge) and of several varieties of *Paspalum*, cock's foot grass and ray grass are sown alone or with white clover in the cold zone.

As fodder crops for mowing *Pennisetum purpureum* and *Tripsacum laxum* are used in the hot and temperate regions and luzern in the cold region.

A very extensive type of stockbreeding is practised in the eastern "llanos", immense tracts of savannah being employed. During the rainy season the low-lying parts of these savannah lands become flooded, so before the floods commence the animals are taken from these "llanos bajos" to the "llanos altos" at an average distance of over 200 kilometres away. The grazing lands in the "llanos bajos" are not enclosed and enclosures are also rare in the "llanos altos". These "llanos" are used almost exclusively for stock-breeding whilst fattening is only rarely attempted. Except on the coastal region of Peru fattening is everywhere carried out by leaving the animals out in the open to roam stretches of the finest artificial meadows covering greater or smaller areas, this is, however, done almost exclusively in the hot and in the cold zones, except the coastal zone of Peru which, as we have seen, is a region differing considerably from the others as regards both agriculture and stockbreeding. Lean stock often travel for several hundred kilometres between the different types of grazing lands.

Although transmissible and other serious diseases are not found in the cold regions, there are many types of these in the hot and temperate zones; infection is generally carried by jiggers, arsenical dips being used as a preventive.

Cattle in the temperate regions suffer from a kind of warble-fly belonging to the genus *Dermatobia*.

Cattle develop comparatively slowly and the cows yield only small quantities of milk, except those of dairy breeds imported from Europe. Such imported animals will give a fairly satisfactory yield of milk if properly tended, and if kept in the cold regions, but never a quantity comparable with that obtained from cows of the same breeds raised outside the tropics.

Horses, which also mostly belong to breeds imported by the Spaniards, are much less numerous than cattle. They are used as saddle and pack animals, but mules are preferred in the mountainous regions and for long journeys, as they are stronger and more surefooted on the mountain paths.

Large numbers of donkeys are bred, mostly in the less mountainous regions and especially along the coast where they are more numerous than horses or mules.

Lamas and alpacas are bred in the cold and very cold regions in Peru and Bolivia. Lamas are indeed the indispensable pack animals in these areas where the high altitude and the bad roads make even the mule useless, not to speak of the horse. A lama can cover some 20 kilometres daily with a load of between 30 and 50 kilogrammes; it produces between 1.5 and 3 kilogrammes of wool 30 cms. long, while the Indians also find the meat edible.

At the time of the 1929 census there were 598,873 lamas in Peru; the census taken in Bolivia on December 31, 1930 showed that there were in that country 1,880,000 lamas, alpacas and "huarizos" (a cross between the lama and the alpaca).

The alpaca resembles the lama; it is a little larger and cannot be trained, the meat is edible, and the wool more plentiful, longer and finer than that of the lama. Indeed a special breed known as "suri" provides an even more abundant wool of a finer quality, but unfortunately this breed is very delicate.

The 1929 census taken in Peru showed that there were 608,380 alpacas and 106,173 "huarizos" in the country at that time; the numbers in Bolivia were probably somewhat smaller.

The vicuna, which lives in the wild state in the highest parts of the Andes, produces a very fine and valuable wool, but the quantity is very small.

According to the "Estadística Agrícola y Pecuaria", 1929, Peru produced at that time 3,416 metric tons of "huarizo" wool and 172 metric tons of vicuna wool.

The following quantities were exported by Peru in 1938: alpaca wool, 2,921 metric tons; "huarizo" wool, 211 metric tons; lama wool, 114 metric tons, vicuna wool, 1,558 kilogrammes.

Fairly large numbers of sheep and goats are found in the mountain zone and in the arid and semi-arid coastal regions: the former are more numerous in the cold and the latter in the hot regions.

The countries with the largest numbers of sheep, in order of importance, are Peru, Bolivia and Ecuador; according to the 1929 census there were more than 11 million sheep in Peru in that year, the wool output being estimated at 3,416 metric tons. During the same year this country exported 1,533 metric tons of wool, 817 of which unwashed; exports of sheep's wool rose to 2,333 metric tons in 1938, 1,616 metric tons consisting of unwashed wool.

In 1544 the Bey had granted these lands to Salem El Ansary whose descendants sold the usufruct to the Siala family in 1752. In 1871, however, *i. e.* before the French occupation, H. H. Mohamed es Sadok making use of the clause which provides that the grant should be renewed at the beginning of each reign, again took full possession of the territory, which had come to be known by the Siala family name, and put it up for sale at 3 piastres per marja.

In fact, however, hardly any sales of land were effected until the establishment of the Protectorate, and it was only as a result of the reports and suggestions of Paul Bourde, the then Director of Agriculture in Tunisia, that the first real progress was made.

To provide an equitable settlement the government of the Protectorate first adjusted the claims arising from earlier occupation and then put the rest of the land up for sale. By means of these measures and also owing to the reduction of the price of the land to 10 francs per hectare, large numbers of concessions were granted within a very short time, without incidents, and without the presentation of any opposing claims.

At the present time the number of olive tree owners may be divided as follows: as against 220,000 Tunisian Moslems who pay the kanoun tax, there are only about 1,000 European proprietors, so that 92 per cent. of the 19 million olive trees belong to the native Tunisians.

Government action, however, was not confined to making grants of land or to confirming former occupiers in their rights; it invited representatives and the government services to collaborate in preparing an oil production plan, of which the principal points were the following:

(1) long-term leases of the olive trees planted on Tunisian State property, wherever they are found in numbers large enough to permit of rational cultivation;

(2) purchase under an instalment plan of olive trees too widely scattered for cultivation along rational lines;

(3) the office managing the *habous* ⁽¹⁾ property to lease the olive trees under *enzel* () or, where this was impossible, to lease them on ordinary long-term contracts;

(4) adjustment of all old claims, without exception, to the Siala lands;

(5) the *amar-bey* of the first day of *Moharrem* 1288 (March 23, 1871) was again put into force, of which the following are the most important provisions: whoever wished to cultivate land in the Sfax district had to make a declaration to that effect before the civil controller or the *caïd*; the land to be sold at

⁽¹⁾ *Habous* properties are properties of which the usufruct has been irrevocably devoted to the furthering of some religious or charitable purpose (corresponding to the *Wakf* properties of other Moslem lands), or have been irrevocably confined within a certain family for such period as there are heirs to enjoy them, after which they become devoted to a religious purpose.

⁽²⁾ *Enzel* is a sort of perpetual lease which guarantees the *enzelist* the usufruct but not the ownership of the property concerned, the very extensive rights of the *enzelist* over the property being therefore limited by certain rights of repurchase by the owner.

10 francs per hectare; to prevent the land from being bought up for speculation, contracts to contain a cancelling clause compelling the purchaser to plant the ground within five years;

(6) establishment of nurseries and appointment of master pruners.

The government devoted special attention to the southern areas of the Regency and more particularly to the Sfax area with a view to utilizing the large tracts of State land hitherto uncultivated.

French colonists adopted the agricultural system already in use in Tunisia, known as the *mgharsa*, a kind of planting lease which has been found to provide the best method of colonization. *Mgharsa* is the association of a landowner with a settler who clears the land and plants it out with trees with woody stems. The capital is provided by the settler, and when the trees begin to bear fruit the land together with the trees on it is divided equally between the settler and the *mgharsi*.

In his preface to a work shortly to appear on the *mgharsa* contract the author writes:

"When, from the heights of Touil El Cheridi or Bogat el Beida, the beholder is enchanted by the vision of an army of olive trees, a shimmering sea of silvery-green, he does not always realize how much effort has led to the result he sees before him, a result which is solely due to the adaptation of the *mgharsa* contract made possible by French colonization.

Still less does he realize that half of the extensive plantations are the property of former agricultural labourers belonging to the shepherd tribes, and that they owe their settlement on the land and their present well-being to the Protectorate.

He can hardly believe that where fire, destruction and neglect had levelled the plain, France, in less than half a century and without monopolizing the lands for French settlers, but on the contrary by confirming the claims of the natives, has been responsible for this magnificent achievement".

Oil-producing regions.

Some information concerning the three different oil-producing centres will be of interest:

Northern and High Tableland Region. — This region comprises the 1st, 2nd and 3rd administrative areas belonging to the Regency and extends over the following administrative districts: Béja, Bizerta, Tabarka, Suk el Arba, Tunis, Zaguan, Grombalia, Tebursuk, Le Kef, Maktar, and Medjez el Bab; at the present time there are over 4,000,000 olive trees in this region.

The annual rainfall varies between 404 and 540 mm., so that conditions for the cultivation of olives are more favourable here than in the other oil-producing regions.

The olive groves consist mainly of trees between 50 and 70 years old. The density per hectare in the first two areas varies between 100 and 300 trees planted at a distance of 6m. \times 6m. or 8m. \times 8m., while young trees are planted at

10m. \times 10m. In the High Tablelands area the density of olive trees reaches 630 trees per hectare.

In most of the administrative districts of this part of the Regency little planting has taken place since 1882; in Tunis and Grombalia, however, the settlers have planted some fine olive groves, especially since 1924-25.

Sahel and Central Region. — Consisting of the 4th administrative area, this second region can be sub-divided into two further regions both of which are very important from the standpoint of oil-production, the Sahel and the Central Region.

The Sahel, where the groves start from the shore, stretches into the interior for a distance of 95 kilometres over a width of 60 kilometres. The distinguishing feature of this region is the conformation of the ground, which is generally undulating, with *hamadas* or little rocky hills.

The great efforts made in this region to provide the necessary dykes have been attended with the most complete success. The rainfall is regular and varies between 300 and 340 mm.; the average density of the trees in the Upper Sahel is 80 per hectare, although in some parts it amounts to almost 100. The olive trees are planted at 8m. \times 8m. and at 12m. \times 12m.

The average annual rainfall in the central region, including the administrative districts of Kairuan and Thala, is 290 mm.

The largest number of new plantations since 1882 have been made in the administrative district of Kairuan.

Southern Region. — This region is characterized by splendid olive groves, beginning with the chief city Sfax and the isolated groups of olive trees at Gafsa, Maknassy, Gabès, Matmata and Tatahuine, while fairly extensive groves are also to be found at Zarzis and Jerba.

The number of trees per hectare varies between only 16 and 20 as the rainfall is extremely variable, and the tree must be surrounded by enough soil if not to provide for its continued growth, at least to keep it alive during periods of drought.

This is the region where French colonization has been most active as regards olive cultivation. From only 360,000 olive trees planted over an area of 18,000 hectares prior to the French occupation, in less than 50 years the number of trees has risen to 7 million covering an area of over 450,000 hectares.

From the social point of view the results obtained are all the more satisfactory in that they offer employment for large numbers of workers, since the machine has so far not succeeded in ousting labour from this branch of agriculture. The tribes and their livestock find constant employment in preparing the ground, while as olive picking is done by hand, large supplies of labour are also required during the harvest season. Thus the greater part of the value of the produce harvested is paid out in the form of wages to the natives.

Olive production.

By means of its courses in pruning, its advice to cultivators, its bonuses for private installations of hydraulic plant and the research work of its technical organizations, the administration has succeeded in ensuring much higher yields

from the olive groves in Tunisia than were previously obtained. Below are given a few figures concerning olive cultivation in Tunisia as it was prior to the French occupation and as it is today:

Regions	Number of olive trees			Difference between 1882 and 1938
	prior to 1882	in 1934	in 1938	
North	2,400,000	4,119,000	4,200,000	1,800,000
Sahel and Centre	4,500,000	7,062,000	7,200,000	2,700,000
South and Extreme South	1,240,000	5,975,000	7,600,000	6,360,000

The yield obtained from these 19 million trees is extremely variable; however, the average annual output is very high so that Tunisia ranks third among the countries exporting olive oil products.

Season	Olive output in caffis (430 kg)	Oil output in quintals
1929-30	813,000	650,000
1930-31	250,000	200,000
1931-32	395,000	315,000
1932-33	688,000	550,000
1933-34	813,000	600,000
1934-35	690,000	550,000
1935-36	810,000	600,000
1936-37	188,000	150,000
1937-38	700,000	550,000
1938-39	290,000	230,000

These are the results of half a century of effort, capital and labour working harmoniously together under the stimulus offered by a friendly and intelligent administration.

Great progress has been made in both output and methods of processing since the early days of the Protectorate. In 1892 dried or salted olives were crushed as required in a stone mill and passed through a wooden press, the oils thus produced being extremely acid. Today 1,500 oil factories equipped with the latest types of machinery produce absolutely pure oils with a pleasant taste.

The few *maasra* still remaining in the outlying districts manufacture oils for local consumption only.

The industries for processing oil by-products are also equipped with modern plant, and the 19 factories for extracting oil from olive cake, with a similar number of refineries and soap factories, can process all the olive cakes produced by the oil extraction plants.

Although no by-product industries existed in 1882, these now complete the equipment of the oil industry, so that today everything possible is extracted from the olive in Tunisia itself, to the great advantage of the national economy.

The Tunisian olive oil industry is fully adapted to present conditions, and factories are now springing up in the country for the manufacture of the drums and containers used for shipping the oil direct to the consumer countries

Commercial organization.

It is only within the last few years that Tunisia has become completely organized commercially for the direct sale of oil to the consumer country, this development not having been possible until the methods of cultivation and preparation had been brought up to date.

During the past ten years the Tunisian Olive Oil Office, with the assistance of the Protectorate Government, has been able to organize protective control over prices offered to the producer and to look for foreign markets. This organization consists of persons concerned with the production of olive oil and has as its aim the safeguarding of olive oil production in all its forms. The office is consequently interested in the olive trees, olive oil and its by-products from every point of view.

Suitable accommodation specially built by the Olive Oil Office, warrantage supported by a government guarantee and interest on the warrant paid by the Oil Office, official control by the office's three laboratories of the quality for both home-consumed and exported oil, publicity in general and export bonuses, are all part of the policy adopted to secure for Tunisia a place on the world market for olive oil corresponding to her increasing output, the large quantities available for export and the quality of the oil produced.

As has already been said, the Protectorate Government has not only favoured the expansion of olive-planting, but has also made it possible for private enterprise to undertake the manufacture of the products, to provide the necessary organization for the stimulation of sales of olive oil both at home and abroad; with the result that about half the population of Tunisia is now engaged in this industry and is reaping the benefit in material well-being.

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President of the Mixed Chamber of Commerce
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INTERNATIONAL CHRONICLE OF AGRICULTURE**THE NETHERLANDS**

The government's intervention in economic matters from the end of August 1939 has been of a very different nature from that of 25 years ago. This is because on the one hand the legal apparatus was in large part already in being, or at least provided for in all its details, and on the other, because the population was psychologically more or less prepared, so that the public's co-operation in the application of the measures to be taken was able to become effective in a very short time. There are still other differences as compared with 1914 thus the Netherlands have become greatly industrialized. According to the census of occupations of 1909, 797,000 persons were engaged in industry; the 1930 census showed this figure to have risen to 1,236,000, while the importance of home industry for the internal market has increased considerably. The index of industrial production for this market (1929 = 100) was 81 for 1925 and 114 for 1938. The level of wages in industry, after making allowance for the increase in the cost of living, is considerably higher than in 1914. Great progress has been made in the organization and regulation of economic life, and the contact between this and the State has become much closer. The government has now a great number of statistical and other data at its disposal to simplify the organization of economic defence. In the case of food supplies in particular the government has been able to make use of the crisis institutions which have been operating in recent years.

Mobilization undoubtedly had very unfavourable effects economically. Nevertheless, the number of unemployed, which is always higher in winter than in summer, increased much less from August to December 1939 than over the corresponding period of 1938. The total of unemployed at the end of 1939 was 330,300 as against 433,600 at the end of 1938, the increase in the last five months of the year having amounted to only 86,600 in 1939 as against 131,800 in 1938.

Index Numbers of Wholesale Prices (1)

(1936 1938 = 100)

	August 1939	November 1939	December 1939	January 1940	February 1940	March 1940
Foodstuffs of vegetal origin .	92.9	101.5	106.5	109.5	112.2	111.2
Foodstuffs of animal origin .	101.3	124.5	120.7	123.6	124.8	121.4
<i>Total all foodstuffs . . .</i>	<i>97.3</i>	<i>113.6</i>	<i>114.0</i>	<i>117.1</i>	<i>118.9</i>	<i>116.5</i>
Raw materials	96.8	130.5	137.0	140.7	144.0	140.5
Finished goods.	101.8	117.2	117.7	119.2	121.0	122.5
<i>General index . . .</i>	<i>99.8</i>	<i>118.4</i>	<i>119.9</i>	<i>122.0</i>	<i>124.0</i>	<i>124.7</i>

(1) No figures have been published for September and October, 1939.

The increase in prices was controlled and checked as far as was considered reasonable and was only tolerated where the cost of production had risen. Nevertheless, as the Netherlands have a very large sea-borne trade, the enormous rise which has taken place in shipping freight rates has led to an increase in the prices of imported articles.

Retail prices, however, increased much less. The index numbers of the retail prices of the principal human food products (August 1939 = 100) were: December 1939, 108.4; January 1940, 108.6; February, 110.2. As regards more especially agriculture, there was also a considerable increase in wholesale prices as is shown by the figures of the following table:

Index Numbers of Prices of certain Agricultural Products and Farm Requisites

(1924-25 to 1928-29 ⁽¹⁾ = 100).

	August 1939	December 1939	January 1940	February 1940
<i>Vegetal products</i>	64	70	71	74
of which: Wheat	78	82	83	84
Peas	48	53	53	54
Eating potatoes	57	54	58	67
Sugar (instead of sugarbeets)	60	60	60	60
<i>Animal products</i>	62	69	73	75
of which: Beef (including veal)	73	73	78	80
Pigmeat	68	84	86	81
Butter	60	69	73	70
Cheese	46	53	57	59
Milk for direct consumption	66	90	94	88
Eggs	53	41	45	66
<i>Total of agricultural products</i>	62	69	72	75
Maize	71	81	81	81
Linseed cake	61	66	66	66
Sulphate of ammonia	41	43	45	45
Basic slag	84	94	94	97
Potash salts (40 per cent)	74	79	81	81

⁽¹⁾ In the case of the figures for potatoes, milk, dairy produce and eggs the base used is the average of the corresponding months of the period 1924-25 to 1928-29.

These figures show, therefore, that the increase in the prices of products sold has on the whole been greater than that of products bought. In this connection it must be borne in mind on the one hand that the prices of eggs (which are not directly regulated) increased in February owing to their scarcity, for which the heavy and lasting frosts were responsible, and on the other hand that the prices of chemical fertilizers are always very low at the end of the summer, this making the increase greater relative to the winter months.

Of measures of a general character, crisis and food provisioning measures etc. mention should first be made of a bill which is intended to modify the method of financing special expenditure. Such expenditure was met in part by extraordinary credits

and in part with the assistance of the agricultural crisis fund. In the first case the technical difficulty arises that the returns accruing from the sale of products bought by the government etc. with these credits cannot be re-employed for economic defence unless with a further express authorization from the two Chambers. In the second case it is legally prohibited to spend on provisioning sums administered by the agricultural crisis fund. For these reasons, therefore, the bill provides for the setting up of a fund which would meet all expenses relating to economic defence and agricultural crisis assistance. The budget for this "Fund for Economic Defence" will have two sections, one covering agriculture and provisioning, the other for trade, industry and navigation.

Another bill contains measures for meeting the cost of interest and paying off the new State loan. In particular, provision is made for an import duty on coffee (unroasted decorticated, 20 florins per quintal; unroasted undecorticated, 17 florins per quintal; other coffees with proportional duties) and an increase of an additional tax expressed as a percentage of the excise duty on sugar from 40 to 50, amounting to a total per quintal of refined sugar of 33.75 florins instead of 31.50 florins ⁽¹⁾

The government intends to make consumers bear the costs of distribution (including costs of storage, etc.) which will of course lead to an increase in retail prices

External trade.

Owing to the need for building up considerable stocks of various commodities it became necessary to encourage imports as far as possible. In many cases the government itself, acting through the Netherlands General Central for Imports (see *Chronicle* for November 1939) imported the necessary goods. In others, the importers were given the right to consign these products of first necessity to the Central ⁽²⁾

Imports did not suffer only from the contraband control by the belligerents and the manner of its application but also from the increase in freight and war risk insurance rates. These two factors had a big effect on the level of prices in the country but, as the shipping, transport and insurance companies are almost always Dutch, using Netherlands capital, the effect of the increase in c i f import values on the balance of payments has not been very serious. There is in addition, however, the uncertainty which obtains as regards the regulation of exports in the exporting countries. For this reason the government bought as far as possible from the Netherlands Indies, acting as a rule through the Ministry of Colonies and the Netherlands Indies Department of Economic Affairs. During the Great War, when economic relations between the mother country and her colonies were for long virtually cut off, this official organization for economic intervention in the various parts of the Empire did not exist. The government is of the opinion that this factor may be of great importance for future development.

In view of the necessity of forming large stocks and the uncertainty which obtains about the possibilities of trade in face of contraband control by the belligerents, it

⁽¹⁾ There are in addition supplements payable to the agricultural crisis fund. Previously these amounted to 20 per cent. of the base duty; but on November 28, 1939 a ministerial decree (*Staatscourant* No. 236-A) raised them to 30 per cent. (6.75 florins). The charges on sugar therefore amount in all to (100 + 50 + 30) per cent. of the base sum, or 40.50 florins per quintal.

⁽²⁾ For this service the Central may levy a tax of 0.25 per cent. *ad valorem*

was impossible to encourage exports to the same extent as imports. The index numbers below (average of years 1937 and 1938 = 100) show this clearly:—

Month			Imports			Exports		
			Value	Volume	Price	Value	Volume	Price
October	1939	. . . . .	96	93	103	65	61	106
November	"	. . . . .	123	115	107	81	75	108
December	"	. . . . .	117	107	110	75	66	114
January	1940	. . . . .	114	90	115	84	72	118

It has not yet been possible to sign new agreements with the belligerent countries to assist foreign trade. The only development in this respect was the move made by the German Egg and Poultry Office, which decided to send an agent to the Netherlands to represent it. The agent will daily fix the price at which the German Office is prepared to buy Dutch eggs. Previously prices had been fixed by the Berlin office twice weekly. The change represents a great advantage for Dutch exporters who will in future be able to decide daily whether or not they want to export and in this way free rein will be given to private enterprise.

Among the measures taken by the Netherlands to regulate external trade was the withdrawal of the veto on exports of flax yarn and straw and its replacement by an export duty which is altered from time to time. The duty enables the prices of these products to be held within reasonable limits. For some time exports of white mustard, poppies and caraway were prohibited but were later again allowed, though in smaller quantities and under the control of an organization set up by those concerned. Exports of black mustard seed on the other hand, have not yet been authorized owing to internal requirements. Exports of legumes have been brought under regulation, usually under the control of organizations formed by those concerned. Exports of potato starch, hitherto encouraged as much as possible, have been restricted, the government's guaranteed export price has been increased. Exports of dairy produce for Germany were centralized and the Dairy Produce Central (*Zuivelcentrale*) now exports these products direct to the corresponding organization in Germany. The former exporters will in future act solely as suppliers to the Central.

In order to put into effect the 1938 law on exports of agricultural products⁽¹⁾ two royal decrees were issued on December 18, 1939⁽²⁾. The first lists the general conditions with which those export control organizations attending to the control of the quality of the products dealt with and their packing, etc., must comply. This decree also contains rules concerning appeals against decisions of the above organizations, rules for the fixing of costs of control, etc. The decree came into force on January 11, 1940. The second decree imposes an embargo on exports of certain garden products, certain varieties of potatoes, fruits and vegetables, tulips and all varieties of onions. The decree came into force in the case of almost all these products on January 11, 1940, for the remainder it will come into force at a date to be fixed.

⁽¹⁾ *Staatsblad* 1938, No. 600.

⁽²⁾ *Staatsbladen* 1939, Nos. 679 UU and 679 VV.

A bill to amend the 1939 law on the co-operation of the citizens in national defence has been placed before Parliament. The government had noted that, owing to the economic war, foreign powers in many cases required declarations by which those making them are constrained to submit to some form of control on the part of the representatives of these powers. According to the government such declarations, although they may help to further commercial transactions, may also in certain cases injure the general economic interests of the Netherlands. For this reason the government is asking for the legal authority to prevent those concerned from agreeing to such declarations.

Measures relating to marketing and production.

MARKETING REGULATION.

The law of September 30, 1938, in accordance with which the powers given the government by the law of 1933 on the agricultural crisis may also be enforced for provisioning in time of war ⁽¹⁾, was extended by the law of December 23, 1939 to December 31, 1940 ⁽²⁾.

Cereals. — Having fixed the prices of wheat, rye, barley, oats and peas, the same thing was done for maize and spelt for such quantities as could not be employed by the producer on his own farm. Surpluses must be supplied to the Office for Supply in Time of Danger, to which the other cereals and peas, etc., are also supplied. For home-grown maize, average quality, 9 florins per quintal is paid, for spelt of average quality 8 florins. On March 13, 1940 a ministerial decree made payable to wheat producers a supplement of 1 florin per quintal of wheat delivered or to be delivered by the producer to his district Wheat Purchase Organization. This supplement serves to compensate for the later increase in the cost of production. At the same time the price at which the monopoly must sell imported foreign wheat was raised by 2.25 florins with a consequent increase in the price of bread flour (in which there is 35 per cent. home-grown wheat) of 1.70 florins. This will in its turn lead to an increase of 1 cent on the price of an 800 grammes loaf.

In the last chronicle we dealt with the regulations to be taken for converting those grazing lands into arable which it was presumed would give good yields as such. It has now been decided that those who so converted land after September 1 or who do so in future will have the right to retain for their own needs a third of the quantity of cereals grown on such lands or to receive a corresponding supplementary amount of mixed foods. They may also retain for the farm bulky animal feeding stuffs cultivated on these lands.

Sugarbeet. — For the 1939 crop 11.25 florins per metric ton was paid without restriction on the quantity supplied, in place of the 10.25 florins for a restricted quantity paid during the preceding seasons. For the 1940 crop special permission was given, operative for the one occasion only, to increase the area sown by 25 per cent., while the guaranteed price was raised to 12.50 florins. Each year the Netherlands import a certain amount of sugar from their colonies, but the provisional increase in home production is not intended to reduce imports but simply to enlarge stocks.

⁽¹⁾ *Staatsblad* 1938, No. 639 C.

⁽²⁾ *Staatsblad* No. 639 OO. In addition there was published in *Staatsblad* No. 639 EEE a royal decree extending the decrees based on the law of September 28, 1938 until the date of expiration of the new law.

Potatoes. — The regulations and restrictions on the area to be sown to eating potatoes do not differ from those for the preceding years. Cultivation will only be permitted after special authorization, and the grower must pay 50 florins for each hectare sown to potatoes ⁽¹⁾. In the case of starch potatoes, an extension of the area by nearly a third has been provided for. This year farmers will have the further right of planting an area greater than that allotted to them. If they do this they must exchange their growing permits for growing and starch-manufacture permits and will be under obligation to supply the whole of the quantity produced to the starch factories. This regulation, which aims at increasing the output and stocks of potato starch for one year only, will not be continued in future years.

Flax — The purchase price offered by the government for home-grown linseed was raised with retrospective effect, from 10 to 12 florins. In the case of this product, however, unlike that of cereals, there is no obligation to hand it over to the representative of the Provisions Office, the farmers also being allowed to sell it to merchants.

Hay and straw — Stockraisers were suffering from the scarcity and increased cost of hay and straw, and this led the government to fix maximum prices for these products. The prices, which are considered to be quite remunerative, are: hay, best quality from grazing lands, 53 florins per metric ton, hay, first quality from lucerne and red clover, 58 florins per metric tons, second and third quality, 4 and 8 florins less, delivered free within a radius of ten kilometres from the farm or the seller's establishment. The price of straw was fixed at 21.50 florins per metric ton at the farm. The Minister of Economic Affairs announced that he would use his right of requisition if offers were insufficient.

Stockraising — This was not the only measure taken in favour of stockraising. The position of this branch of agriculture is still more difficult than before the war. Selling prices have throughout remained below the cost of production and, although the Dairy Produce Central has controlled and directed exports to ensure more regular marketing, even the export prices of butter have shown only a relatively small rise. There are, however, several particularly unfavourable factors. The heavy frost had a very bad effect on the meadows and grazing lands, there was an outbreak of anthrax, the output of milk fell off owing to a lack of bulky feeding stuffs (mainly attributable to the bad weather) and of food concentrates containing albumens (attributable to the difficulties of sea transport). The following measures were taken in addition to the regulation of hay and straw prices. Compensation will be paid to stockraisers for cows dying of anthrax between December 1 and March 1; if in the spring the prices of young calves fall owing to the export restrictions, the government will buy and convert into tinned meat the number of young calves found necessary to maintain prices. Between March 15 and September 15 the government will buy all skimmed milk powder offered it, at a price of 15 florins per quintal. This last measure, which also affects cheese prices, is considered as one of the most important taken in support of stockraising in recent years. Finally it should be mentioned that the "winter price" of butter (combined price and tax), fixed this year at 1.60 florins per kilogramme, and which was to have terminated on March 31, has been extended until April 30.

⁽¹⁾ Those cultivating less than 50 ares (100 ares = 1 hectare) are exempted from this payment for an area of 10 ares in the case of clay soils and 20 ares in the case of other soils. This measure, which also applied in earlier years, is intended to assist small farmers.

REGULATION OF PRODUCTION.

As was remarked in the November chronicle, the law of September 9, 1939 on agricultural production opens the possibility of issuing instructions both general and detailed as regards arable and livestock farming. These instructions have now been drawn up and are as follows ⁽¹⁾:

Oats. — It is prohibited to sow more than a fifth of the arable land of each farm to oats. This restriction does not apply to the first sowing on lands newly broken up.

Flax. — In general this crop will be authorized for all land for which a permit has been requested, on condition, however, that those so requesting are affiliated to agricultural crisis organizations and that they plant the whole area authorized under flax.

Caraway. — Only a limited area will be authorized for the 1941 harvest of this crop, which is biannual in general 40 per cent. of the average area for the years 1937 and 1938, that is to say a total of about 2,000 hectares

Mustard, poppy and beetroot seed. — The growing of the poppy and black mustard will be authorized for an area corresponding to the average area of the years 1937, 1938 and 1939, the cultivation of white mustard will in general be prohibited, the cultivation of sugarbeet and fodder-beet seed will not be restricted for the 1940 crop, while for 1941 an area will be allowed equal to the average of the years 1938, 1939 and 1940.

Onions. — These may be grown in open field on an area equal to the average area for 1937, 1938 and 1939, but the government has proposed to farmers a further voluntary restriction

Garden produce. — Farms of over 10 hectares which in past years cultivated horticultural products in open field will not, with special exceptions, be allowed to do so in 1940. The plants so affected are vegetables (as principal or catch crop), early potatoes (which may or may not be followed by a catch crop), Brussel sprouts, witloof endives, red cabbages and cauliflowers. The tending of orchards will only be allowed under special authorization

Poultry. — In regulating poultry farming the aim has always been to restrict the number of chickens. This was done by prohibiting hatching in incubators after a certain date, and also allowing it only in limited numbers. The figure for 1940 is only 80 per cent. of that allowed for the preceding year, while the period for hatching has been fixed for from January 1 to May 5. This regulation does not apply to natural hatching, which is of little importance commercially.

LAND RECLAMATION.

Fresh progress has also been made in breaking up recently. The figures for 1939 are not yet known. In 1938 10,200 hectares of uncultivated land were ploughed up and 500 hectares of other land, while reploughings took place on 1,600 hectares. The government has now accepted in its main outline a plan for ploughing up, by which all land which has not to be preserved in its original state as enclosures and natural parks will be ploughed up with the help of the unemployed. There are very wide differences of opinion as to the importance of this scheme, however, as the absence of accurate statistics regarding these uncultivated lands leads to very divergent estimates of their area

⁽¹⁾ They were issued on several occasions but are based principally on the ministerial decree of December 8, 1939 (*Staatscourant*, No. 241).

Drainage of the Zuiderzee.

The drainage of the Zuiderzee was dealt with in our preceding chronicle. The first polder, which was drained in 1930 and which is the smallest of the four to be constructed (having only 20,000 hectares out of a total area aimed at of 190,000 hectares), has almost all been brought into cultivation. At the end of 1939 14,800 hectares had been drained and 13,200 hectares leased. The land remains the property of the State, only land situated in the centre of the village, where those concerned must do their own building, being given in emphyteusis. By the end of 1939, 335 farms had been leased out covering an area of 12,500 hectares, the remainder being land without building.

More than three-quarters of this land is now being used for arable. The work of constructing dikes, canals, locks, etc., for the second polder has proceeded normally. At the end of 1939 less than ten kilometres of the main dike remained to be built. The heavy frost this winter hindered the continuation of the work, while the war in Europe prevented the arrival of certain building materials. The importance of the work may also be illustrated by the fact that in 1939 more than 5.3 million cubic metres of land were dredged in making canals and improving the land, such work being much easier now than after the polder has dried.

Work of public and private agricultural organizations.

These organizations have for long existed in their present form. Firstly, there are three central agricultural organizations:

- (1) the *Koninklijke Nederlandsch Landbouw Comité* = K. L. N. C. (Royal Netherlands Committee for Agriculture, a non-religious body)
- (2) the *Katholieke Nederlandsche Boeren- en Tuindersbond* = K. N. B. T. B. (Netherlands League of Catholic Peasants and Market-gardeners)
- (3) the *Christelijke Boeren- en Tuindersbond in Nederland* (League of Christian Peasants and Market-gardeners in the Netherlands).

The first two organizations represent federations of independent regional organizations, which in their turn consist of local groups. The third organization is based on provincial sections with local sections. The three centrals have a joint committee of action. They also join forces, in all matters relating to the special interests of the dairy industry and horticulture, with the central organizations for these branches—respectively the *Algemeene Nederlandsche Zuivelbond* = F. N. Z. (General Netherlands Federation of Regional Associations of Dairy Industry Co-operatives) and the *Koninklijke Nederlandsche Maatschappij voor Tuinbouw en Plantkunde* (Royal Netherlands Society of Horticulture and Botany). These organizations follow closely and from day to day the economic development of the agricultural situation and government intervention and place their wishes and views before the Minister of Economic Affairs. In addition, each of these bodies, as well as the regional organizations, studies on its own account questions particularly affecting it.

Several of these organizations have a farm accountancy office and experimental farms or gardens. Others have founded, and with the help of subsidies from the State (and frequently other public bodies) keep up agricultural, horticultural and domestic training schools. They have also helped to set up agricultural co-operatives of every description which sometimes even remain closely linked with the associations, etc.

Besides the general agricultural organizations mentioned above there is also the *Nationale Bond Landbouw en Maatschappij* (National Agricultural and Social League) which starts from different principles. It is concerned almost exclusively with the

agricultural and horticultural sections of the population as distinct from the other social classes and does not co-operate with the other organizations

In this summary, which does not attempt to be complete, mention should also be made of: the herdbooks associations, stud-books associations, etc., the *Uitvoer-Controle-Bureau voor Groenten, Fruit en Aardappelen* — U. C. B. (Export Control Bureau for Vegetables, Fruit and Potatoes), the *Nederlandsche Algemeene Keuringsdienst* — N. A. K. (Netherlands General Service for the Control of selected Plants for Reproduction), the associations concerned with special matters in many other branches of agricultural work and finally the *Nederlandsche Heide Maatschappij* (Netherlands Heath Society), which is concerned with the ploughing up of uncultivated land, the maintenance and administration of ploughed-up land and others, generally for third parties. It has three sections—for freshwater fishing, land consolidation, and fruit growing

J. P. VAN AARTSEN

URUGUAY

In the second half of 1938 and more especially in the first months of 1939 Uruguay gradually recovered from the consequences of the depression which had settled on its economic life at the end of 1937 and over the first half of 1938. The exports of meat and meat extracts expanded again, those of skins and hides showed a gradual recovery, the excellent wheat harvest allowed a quite considerable export of wheat—admittedly supported by the payment of export subsidies—and the linseed exports also proved exceptionally favourable. Even the wool exports which had given rise to so much anxiety as late as the spring of 1939 ⁽¹⁾ enjoyed the favourable consequences of the improved state of the world market—partly again as a consequence of the payment of export subsidies which were once more extended to August 31, 1939—to such an extent that at the end of September they amounted to 126,225 bales ⁽²⁾, exceeding even the high level of 1936-37 (120,154 bales). Thus Uruguay entered the new season of 1939-40 with the best prospects, when in September the war broke out in Europe and the situation changed radically.

The outbreak of the war necessarily produced a deep shock in a country so largely dependent on its foreign trade as Uruguay and which, despite its efforts to achieve a greater economic independence, can so little depend on its own output of many necessary agricultural and industrial products. The following figures show how strong were the commercial ties linking up Uruguay with the countries now engaged in war.

The memory of the increased export possibilities provided for the neutrals by the Great War originally gave rise to expectations of a boom in Uruguay. At the same time, however, it was widely feared that, at least at the beginning, considerable difficulties might arise as regards the obtaining of vital foodstuffs, industrial raw materials and manufactured products. For Uruguay depends largely on foreign sources for the following products, to name only the most important: sugar, potatoes, food oils, mate, coffee, cacao, preserved fish and vegetables, codfish, pulse, coal, metals (especially iron), lubricating and fuel oils, oilseeds, machines and tools of every sort and cars with their spare

⁽¹⁾ See the September 1939 number of this *Bulletin*, p. 443.

⁽²⁾ 1 bale = 420 kilogrammes.

Shares of the European Belligerent Countries in Uruguay's Foreign Trade ⁽¹⁾ ⁽²⁾.

(Thousand pesos *)

Countries	1936	1937	1938	1938 7 months	1939 7 months
United Kingdom :					
Imports from	11,896	13,517	14,751	8,767	6,999
Exports to	23,340	23,896	25,196	16,152	11,110
Germany :					
Imports from	6,220	8,881	12,492	6,644	7,456
Exports to	10,085	13,063	22,651	11,671	10,748
France :					
Imports from	1,414	1,784	1,617	1,036	737
Exports to	5,660	4,583	7,148	3,620	2,711
Poland :					
Imports from	188	473	435	243	1,004
Exports to	260	356	2,130	825	2,785
Finland :					
Imports from	135	105	166	128	101
Exports to	33	52	120	84	100
Other countries (3)					
Imports from	40,082	55,573	44,931	26,807	20,301
Exports to	50,922	56,827	39,110	23,004	37,436
TOTAL IMPORTS	65,935	80,393	74,395	13,625	36,658
TOTAL EXPORTS	90,300	98,777	96,355	55,416	64,890

* Imports are given at their values as declared at the customs, which are about 10 per cent. below their real values. Exports are reckoned at their market values.

(1) *Boletín de Hacienda publicado por la Contaduría General de la Nación*. Economía - Finanzas - Estadística. Montevideo, 1938, 25th year No. 2; 1939, 26th year Nos. 1-2-3; 8-10.

(2) Since 1937 there had been hardly any trade relations with the Union of Socialist Soviet Republics. Imports from the U. S. S. R. which had always been small were decreasing each year, whilst exports to the U. S. S. R. had completely ceased.

(3) Of the "other countries" the most important for the foreign trade of Uruguay is the United States of America. Imports from this country (in thousand pesos) amounted to 8,820 in 1936, 10, 897 in 1937, 8,966 in 1938, 6,465 in the first seven months of 1938 and only 1,587 in the corresponding months of 1939. Exports to this country (in thousand pesos) amounted to 13,991 in 1936, 13,967 in 1937, 3,830 in 1938 and 1,436 in the first seven months of 1938. In the first seven months of 1939, however, such exports rose to 5,270, and for the whole year 1939 would seem even to have exceeded the high figures of 1936 and 1937.

parts, preparations of a medicinal nature or destined for the protection of plants, cloth and clothing, building materials and glass.

Yet Uruguay was in a much better financial condition at the outbreak of the present war than in 1914, being provided with a gold-reserve of 80 million pesos and considerable quantities of foreign exchange, so that even if exports met with difficulty it would still be possible to buy important raw materials and foodstuffs. Moreover the stocks within the country were at such a level as to preclude any cause for serious anxiety, being suffi-

cient in most cases to last for several months, whilst the only goods concerning which there was any ground for anxiety were sugar and coal. The stocks of this latter commodity at the outbreak of the war only provided a 2 months' supply, and were reserved for industrial purposes, recourse being had to home-produced substitute fuels for ordinary household purposes, whilst conversations were entered into for the obtaining of supplies from the United Kingdom. As regards sugar, Uruguay had always been entirely dependent on imports, which amounted to 518,400 and 518,700 quintals in 1937 and 1938 respectively. The sugar supplies in September 1939 were such as to suffice for three months, and the government at once opened negotiations with Argentina and later with Brazil and the Netherlands (the Netherlands Indies) as regards the provision of further supplies. The State also intervened in the meat market to the extent that it bound the State *Frigorífico Nacional*, which has the monopoly of the supplying of Montevideo with meat, not to raise meat prices even should stock prices rise. Any possible losses would be made good out of the funds constituted by the profits on foreign exchange dealings of the State Bank.

Despite the satisfactory state of supplies there were indications immediately after the outbreak of war of a certain scarcity of supplies and of a rise in prices. As is usual in such circumstances, a part of the population was seized by the desire to lay up stocks, whilst on the part of the wholesale and retail dealers there was a contrary tendency to withhold goods. Hence the government intervened vigorously. Referring back to a law of January 20, 1917 the government already in the first days of September passed a law ⁽¹⁾ and several decrees providing measures against the rise in prices and the withholding of necessary goods, and regulated for the three following months the sale of the most important foodstuffs, agricultural requisites, building materials, chemical products and medicinal goods. These commodities were all, as long as the existing supplies lasted, to be disposed of at the prices prevailing till the end of August 1939 and in quantities not below 75 per cent. of the sales which had taken place in the period from August 29, 1938 to August 29, 1939. A decree of October 6, 1939 ⁽²⁾ went even further, ordering the expropriation of essential commodities up to a value of 2 million pesos for purposes of subsequent resale, and providing for the compensation of the former owners at a rate not exceeding 115 per cent. of the total cost of the expropriated commodities.

External trade.

ENCOURAGEMENT OF IMPORTS.

These measures for the maintenance at a low level of internal prices and for the ensuring of adequate supplies by recourse to existing stocks were accompanied by other measures for the regulation of imports having the same purpose. Thus imports were encouraged by releasing such persons or firms as wished to import essential supplies from the necessity of procuring an important licence, and not reckoning the foreign exchange needed to pay for such imports on the usual import quota ⁽³⁾, whilst as between com-

⁽¹⁾ Decree of September 2, 1939. *Diario Oficial*, No. 9904, September 8, 1939. Also law of September 5, 1939. *Diario Oficial*, No. 9906, September 11, 1939. Also decree of September 7, 1939. *Diario Oficial*, No. 9906, September 11, 1939.

⁽²⁾ *Diario Oficial*, No. 9936, October 17, 1939.

⁽³⁾ See the September 1939 number of this *Bulletin*, p. 439.

peting importers the preference was given to those buying at the lowest prices. The State certainly expected some rise in the prices of imported goods as inevitable under the circumstances of the times, but it nevertheless kept a watch over prices by examination of the contracts before granting the necessary foreign exchange by the State Bank ⁽¹⁾, or took over the payment of a part of the import duties in order to keep prices low in the internal market ⁽²⁾

LEVY OF AN EXCESS PROFITS TAX.

The government expected to obtain the financial resources necessary for keeping internal prices low through a tax on excess profits, which was introduced shortly after the outbreak of the war when rising prices and expanding exports of livestock products were expected. This policy was based on the idea that from a social standpoint it was only just that those who profited by war sales should also help by payment of this tax to counteract the increase in the cost of living brought about by the war. Furthermore it was alleged that the sections of the population affected by the tax would be those who in their times of difficulty had lived to some extent at the cost of the community through the granting of premiums, the reduction of mortgage rates and land taxes. Hence a law of September 28, 1939 ⁽³⁾ imposed a tax of 25 per cent on excess profits derived from the sale of animal products such as meat, wool, hides etc. Excess profits were defined as the difference between the average of the prices prevailing between July 1, 1938 and June 30, 1938 and the prices reached after the passing of the law. The tax must be paid previous to the shipping of the product, in the form of a percentage of the full *f.o.b.* value of the product corresponding to 25 per cent of the excess-value. Separate decrees laid down the precise percentage for the different products, *e.g.* 5 per cent for wool and sheep skins ⁽⁴⁾, 6.5 per cent for salted hides and tallow ⁽⁵⁾, 3.5 per cent for beef ⁽⁶⁾. But this measure which had right from the beginning met with vigorous opposition from producers did not have a long history. As early as November 25, 1939 ⁽⁷⁾ it was declared inapplicable to wool and sheepskins until further notice, and a decree of January 16, 1940 similarly exempted meat, salted hides and tallow.

For contrary to expectations no boom conditions had set in so that there were no excess profits to be taxed. The produce of South Africa and Australia was not so completely taken up by the United Kingdom as to remove these countries as competitors from other markets to the degree that had been expected in Uruguay. Germany which had been so good a customer for Uruguayan meat and wool ceased her purchases completely as a result of the blockade. The United Kingdom drew her supplies predominantly from her Empire and moreover kept a careful check on the prices of the products she

⁽¹⁾ Decree of September 29, 1939 on sugar purchases. See *Diario Oficial*, No. 9925, October 3, 1939.

⁽²⁾ Decree of October 9, 1939, No. 9944, October 26, 1939 on the deduction of a part of the sugar import duty and the compensation of the customs authorities from the proceeds of the excess profits tax.

⁽³⁾ *Diario Oficial*, No. 9925, October 3, 1939.

⁽⁴⁾ Decree of September 29, 1939, *Diario Oficial*, No. 9944 October 26, 1939.

⁽⁵⁾ Decree of October 9, 1939, *Diario Oficial*, No. 9934, October 14, 1939.

⁽⁶⁾ Decree of November 4, 1939, *Diario Oficial*, No. 9970, November 27, 1939.

⁽⁷⁾ *Diario Oficial*, No. 9977, December 5, 1939.

imported. France's purchases also declined materially, but as her imports from Uruguay had always been on a small scale this made less difference. The neutrals and non-belligerents for their part showed little desire to buy, apart from the increased difficulties of overseas trade due to the shortage of shipping tonnage. Hence although originally the prices for wool, hides and wheat showed a rise, this activity in the markets was not of long duration. Moreover in the first months of the war the peso rose 20 per cent. in value relative to the pound sterling and to a smaller extent relative to the American dollar. This factor certainly facilitated Uruguayan purchases abroad but had a depressing effect on the export markets, till the controlled exchange rate of the peso was adapted to the desire or ability to purchase of the customers of Uruguayan products.

THE EXPORTS OF THE PRINCIPAL PRODUCTS.

Animal products represent 83 per cent. of the total value of Uruguay's exports, and of these animal products wool is easily the most important commodity accounting for about 40 per cent. Hence Uruguay's wool exports are of the greatest importance for the development of the national economy.

Wool. — Owing to the large exports of 1938-39 Uruguay was able to begin the new season without a carryover. The total wool exports for 1938-39 amounted to 126,225 bales as against 91,431 bales in the preceding season, the principal purchasers having been Germany with 35,670 bales, Belgium with 18,001 bales, the United States of America with 16,352 bales, Italy with 15,843 bales, the United Kingdom with 10,614 bales, the Netherlands with 8,251 bales, Poland with 7,545 bales and France with 6,374 bales. Prices also had risen and at the end of the season some of the wool was sold at 9 pesos per 10 kilogrammes as against a price of 6.50 pesos in January 1939.

The new clip was estimated at between 50 and 60 million kilogrammes, or about 120,000 bales, and the quality was also judged good. But the hopes cherished as regards the selling of the wool met with disappointment, at least in the initial period. Certainly in September there were considerable shipments to the U. S. A., and some good long-term business was done as regards the new clip. After that, however, the activity of the markets declined sharply, partly owing to the higher international value of the peso, partly to the depressing effect of the excess profits duty. Between October 1, 1939 and January 19, 1940 41,184,266 kilogrammes of wool came on the market as against 42,248,681 kilogrammes in the same period of the preceding season. Of this quantity a part was disposed of in the local trade. From time to time a big foreign order was received, but in the last three months of 1939 the number of bales shipped from Montevideo, the main shipment centre, only amounted to 19,148 bales as against 30,116 in the last three months of 1938. However, in January 1940 the dealings showed a considerable recovery, mainly owing to purchases by the U. S. A., so that the exports for January 1940 amounted to 32,716 bales as against 35,179 bales in January 1939—a decline of only 2,463 bales. In February ⁽¹⁾ markets were less active than in January, but nevertheless by February 29, 1940 exports exceeded the level of the previous year, amounting to 51,464 bales as against 50,000 bales in the first two months of 1939. From October till December 1939 the demand was mainly for the coarser and medium-quality wools but in January there was a demand also for the superior cross-bred qualities. Prices in the

⁽¹⁾ *Fortnightly Review of Business and Economic Conditions in South and Central America, Portugal, etc.* Bank of London and South America Ltd. Vol. 5, No. 91, March 23, 1940, p. 67.

middle of January 1940 varied between 8.50 and 8.60 pesos per 10 kilogrammes for the dearest and 7.50 and 8.00 pesos for the cheapest wools, but had risen by the end of February to 10.30-10.50 pesos per 10 kilogrammes for the better qualities and to 9.20-9.60 pesos for the inferior qualities.

Up till February 29, 1940 the U. S. A. was the most important customer, having taken 21,916 bales (about 40 per cent of the total), followed by Sweden with 8,399 bales, Italy with 6,540 bales, the Netherlands with 5,250 bales, Switzerland with 3,355 bales, Japan with 2,546 bales and Belgium with 1,137 bales. Great Britain and France did not figure among the purchasers at all. On the other hand wool was exported to Canada where there is at present a strong demand. Owing to the absence of New Zealand cross-bred wool Canada has indeed become a buyer on the South American markets and has for the interim placed her wool exports from these countries on the free list.

Skins and hides. — Skins and hides in normal years constitute some 12 per cent. of Uruguay's exports, but here again for the first months of the war the market was inactive for all types and only in January was there a revival of activity. In 1938-39 the export of unclipped skins, for which France was in most years the chief purchaser, had doubled, but the demand in the new season has been very slight. On the other hand France appears to have given an order of a type very unusual for Uruguay, which generally exports leather in the form of a raw material—namely an order for 45,000 pairs of boots which order may be expanded to 500,000 pairs.

Meat — In the period 1932-37 the exports of meat and meat extracts constituted some 25 per cent of the value of total exports, the percentage having, however, fallen from 32.1 in 1932 to 19.8 in 1937. In 1938 the exports of meat and meat extracts reached about 97,500 tons. In the first eight months of 1939 they amounted to 45,724 tons, a decline of 18 per cent. as against the 55,806 tons exported in the corresponding period of the previous year, this decline having been mainly due to decreased purchases by the United Kingdom. Since the outbreak of the war meat exports have risen again.

As the belligerent countries have centralised their buying organization in order that competition might not drive up prices in their negotiations with foreign countries, the Uruguay Government by its decree of September 13, 1939⁽¹⁾ ordered that all activities in connection with the sale of meat should be centralised in one single organization. With this end in view, the Meat Economy Commission founded in 1937 was placed under the Ministry of Agriculture, which in future is to receive all offers, settle all prices and represent the producers and processors in the conclusion of all international agreements.

It was in this capacity that the Ministry negotiated with the British Government regarding the purchase of 12,000 tons chilled beef and 8,000 tons of mutton and lamb to a value of £ 862,938 and due for delivery between November 1939 and February 1940. The foreign exchange deriving from this export was to be bought by the State Bank at the rate of 6.08 pesos per pound sterling and the packing houses were to receive a subvention of 1.40 pesos per pound sterling from the fund composed of the gains derived from exchange dealings of the State Bank, so that they might without loss be able to pay the prices prevailing in the livestock market at Montevideo.

The United Kingdom in addition bought 10,000 tons of corned beef.

⁽¹⁾ *Diario Oficial*, No. 9919, September 26, 1939.

In November a further agreement seems to have been reached with Belgium, which country was wishing to buy 400,000 dollars worth of meat from Uruguay at the same prices as the United Kingdom.

Wheat and linseed. — Wet, cold and stormy weather combined with ravages caused by insects and diseases produced a wheat harvest which was inferior in quality and in some districts as much as 60 per cent. less in quantity than that produced in more normal years. According to a communication of February 14, 1940 by the Uruguay Government to the International Institute of Agriculture the wheat harvest this year only amounts to 260,445 tons as against 420,787 tons in the previous year—when, however, the area under wheat was admittedly greater. Taking into account the carry-over from last year's crop the total supplies of wheat for the current year amount to 338,800 tons of which 324,638 tons are for home consumption and already agreed exports, leaving available for disposal abroad only 14,162 tons⁽¹⁾

The linseed crop amounted to 119,242 tons as against 112,442 tons in 1938-39, the area under this crop having at the same time risen from 183,083 to 226,232 hectares. In order to encourage linseed exports and at the same time assure producers of adequate prices a decree of February 16, 1940⁽²⁾ fixed a minimum price of 8.50 pesos per 100 kilogrammes f. o. b. for linseed, and arranged that the difference between this price and the world market price should be covered through the intermediary of the Commission for the Encouragement of Exports from the State Bank's funds composed of the gains derived from exchange dealings. A decree of February 27, 1940⁽³⁾ encourages the export of linseed oil by providing that all foreign exchange derived from the export of this product shall be purchased by the State Bank at the free rate wherever the agreements made with the purchasing country permit of such a course.

TRADE NEGOTIATIONS WITH THE UNITED STATES OF AMERICA

The negotiations which the United States of America was conducting with Uruguay since July—parallel to similar negotiations being conducted with Argentina—for the conclusion of a trade treaty were terminated in January 1940 without any agreement having been reached. In Uruguay hopes had been entertained that concessions might be granted, if not as regards chilled and frozen meat, at least as regards the exports of such commodities as linseed, linseed oil, tallow, oleo-stearin, meat extracts and conserves and wool⁽⁴⁾ to the United States of America. The United States of America on their side found the imports control and the bilateral trade policy adopted by Uruguay to constitute a principal obstacle in the way of the conclusion of an agreement, but the breaking-off of the negotiations was explained with reference to the simultaneous breaking-off of the negotiations with Argentina in which it had proved impossible to come to any agreement regarding the import conditions for linseed and tinned meat.

⁽¹⁾ *Fortnightly Review of Business and Economic Conditions in South and Central America, Portugal*, Bank of London and South America Ltd. Vol. 5, No. 90, March 9, 1940, p. 53.

⁽²⁾ *Diario Oficial*, No. 10048, March 4, 1940.

⁽³⁾ *Diario Oficial*, No. 10049, March 5, 1940.

⁽⁴⁾ *Business Conditions in Latin America and the West Indies*, November 1939, The Royal Bank of Canada, Montreal, P. Q. Foreign Trade Department.

Measures relating to the marketing of agricultural products.

In 1939-40, at a time when a good harvest was still counted upon, Uruguay again fixed a minimum price ⁽¹⁾ for wheat which in Montevideo for good sound grain of the new harvest was to amount to 5 pesos per 100 kilogrammes in December and January and then to rise by 0.05 peso every two months to a maximum of 5.25 pesos in November 1940. To support this maximum price the State Bank was empowered to buy up to 30,000 tons of wheat as also to sell or export wheat, if necessary even paying export premiums on wheat and wheaten flour. The details of the execution of this measure are laid down in a decree of December 27, 1939 ⁽²⁾. Since December wheat prices have risen steadily, amounting at the end of January to 5.75-5.95 pesos per 100 kilogrammes for the poorer qualities and up to 6.20 pesos for the best quality grain. In February, however, both wheat and linseed prices showed a slight fall.

Land tenure system.

Protection of tenant farms. — A problem which has in recent years frequently required the attention of the legislature is that of the tenant farmers who have been given notice to quit. In 1937 Uruguay was calculated to cover a total area of 186,926 square kilometres with a population of 2,093,331 inhabitants, of which 92,356 were classified as employed in agriculture. The number of stock-raising and arable farms was given as 35,704, of which in 1936-37, 42.49 per cent. were found to be worked by the owners themselves, 39.93 per cent. by tenant-farmers, and 17.58 per cent. by part-tenant farmers. These proportions have indeed each year shown a slight but steady change in the same direction since 1932-33, when the percentage of owners was 45.76, of tenants 38.60 per cent., and of part-tenants 15.64 per cent.

The existence of such a high percentage of tenant-farmers subject to living and working conditions which are so little secure naturally gives rise to serious problems, especially as these tenant farmers always live under the threat of receiving notice to quit. Moreover such a notice is by no means always the result of a non-fulfilment of their obligations on the part of the tenants. On the contrary it may result as the consequence of a change in the ownership of the land or because in a period of high prices for live-stock produce the owner finds it more profitable to convert arable into pasture land. Despite the abundant legislation on settlement it often proved impossible for the dismissed tenant, even in cases where he had always punctually paid his rent, to find new land to rent, and this remained the case even after the decree of March 17, 1938 ⁽³⁾ entrusted the State Bank and the State Mortgage Bank with the duty of finding lands for renting. New laws and decrees were continually being passed postponing the date by which the tenant farmers who had been given notice to quit were finally to evacuate their holdings, the last such measure fixing the date of March 15, 1940. Now, however, on December 20, 1939 ⁽⁴⁾ the long-desired law was at last passed whereby the confiscation of land in favour of the dismissed farmers is declared a measure necessary for the common welfare and

⁽¹⁾ Law of December 20, 1939. See *Diario Oficial*, No. 9994, December 27, 1939.

⁽²⁾ *Diario Oficial*, No. 10001, January 5, 1940.

⁽³⁾ *Diario Oficial*, No. 9470, March 23, 1938.

⁽⁴⁾ *Diario Oficial*, No. 9998, January 2, 1940.

the State Mortgage Bank is empowered to acquire land suitable for this purpose. Such land must be in close vicinity to means of communication and as far as possible in districts where there are many tenant farmers with notice to quit and whose economic circumstances are such as to make them deserving of support. The division of the lands is carried out by the Mortgage Bank. The farmers are given possession of their lands as part-tenants, prospective purchasers or some other status which guarantees those of them who fulfil their obligations undisturbed possession for at least ten years. The Mortgage Bank may also sell land, but in this case disposal of the land by way of gift or resale is forbidden to the purchaser.

Homestead law — The Homestead Law of May 5, 1938 ⁽¹⁾ also serves to bind the country dweller to the soil. By this law a homestead is defined as a family undertaking not exceeding 5,000 pesos in value, which may be founded jointly by husband and wife or separately by either spouse or by a grandparent for a grandchild under age. Property subject to debt cannot be converted into a homestead, but also neither the homestead nor any produce deriving from it may be subject to confiscation. The homestead can, however, be disposed of under certain conditions.

Land Settlement Commission — The efforts to bring about a more productive use of the land led to the appointment of a commission in 1938 to examine the existing legislation on questions of settlement and the compulsory exploitation of the soil ⁽²⁾, as also to consider such technical questions as the problem of soil erosion.

Agricultural credit.

The oldest and most important financial house of Uruguay is the State Bank (*Banco de la República Oriental del Uruguay*), which was founded in 1896 very largely by State backing and in 1911 went completely into the possession of the State ⁽³⁾. Previous to the foundation of the bank the great landowners were certainly able to obtain credit in the towns, but for the smaller farmers and firms no such facilities existed. In addition most of the banking business was in the hands of foreigners actuated by purely profit-making motives. In view of the predominantly agricultural nature of the Uruguayan economy cheaper credit was one of the most pressing needs of the country. A law of January 19, 1912 created a special agricultural section within the State Bank, which originally concerned itself with mortgage credit and loans of seeds, but in 1916 introduced loans on grain warrants. A law of March 21, 1918 extended its activities to cover agricultural pledge operations (*prenda agraria*), a form of credit whereby the borrowing live-stock farmers need only pay back the received loan when they sell the good serving as security for the loan, the purpose of this arrangement being to prevent sales at rock-bottom prices at times when the markets are depressed. Since 1926 the State Bank has been engaged in the granting of three types of agricultural credit:—

(a) Loans to provide capital for the purchase of land and the carrying-out of permanent improvements and to be repaid within a period of five to ten years such loans being designed to further the growth of small holdings.

⁽¹⁾ *Diario Oficial*, No. 9505, May 10, 1938.

⁽²⁾ Decree of August 11, 1938. See *Diario Oficial*, No. 9597, August 27, 1938.

⁽³⁾ HANSON, SIMON G.: *Utopia in Uruguay, Chapters in the Economic History of Uruguay*, New York, 1938, pp. 73-74.

(b) Loans to provide working capital for the purchase of draught animals, agricultural machinery, and also agricultural pledge operations in which repayment within the same year is not to be expected.

(c) Short-term loans for the purchase of seeds, covering the harvesting expenses, the storing of grain, etc which will be repaid within the same year.

A numerous staff of inspectors supervises the management of the farms which have received loans and examines the possibilities of raising their profit-making capacity. Under the law of September 24, 1938, the bank also grants loans to industrial concerns engaged in the production of cheese, butter and wine.

On December 31, 1937 the State Bank had the following outstanding credits:—

Agricultural credit:

agricultural pledge operations	Pesos	1,273,239
mortgage credit (<i>prenda agraria</i>)	»	2,786,603
discounted agricultural bills	»	1,246,830
seed credits	»	146,750
current account credits	»	684,345

Total . . . Pesos 6,137,767

Industrial credit » 1,395,303

Another financial house serving agriculture is the State Mortgage Bank (*Banco Hipotecario del Uruguay*), which was originally a private institute but in 1912 went over into the possession of the State. A law of January 22, 1913 empowered the State Mortgage Bank to spend 500 million pesos in the purchase of lands to be used for settlement purposes ⁽¹⁾. The law of June 20, 1921 permitted the granting by the State Mortgage Bank of loans up to 85 per cent of the value of the piece of land destined for arable farming. In accordance with this law a settlement commission was appointed with the functions of purchasing lands and distributing them among the various applicants. The law also laid down low interest rates and stipulated that in the allocation of lands preference should be given to native farmers and foreigners with at least six years' experience of agricultural life. The law of September 10, 1923 set up an independent section on settlement questions within the State Mortgage Bank. The loans for purposes of settlement granted by the Mortgage Bank up till December 31, 1933 amounted to 4,428,000 pesos, and the land burdened with mortgages arising out of these loans amounted to an eighth of the total cultivated area of the country.

In addition to the granting of money credits the granting of loans in the form of seeds has become ever more usual, especially since 1937. This form of credit is of especial interest in that it represents a first step towards personal credit, and as such is available also to farmers who in their character of tenants would not be able to offer any guarantees based on real property. The loans are in the form of seeds and the interest is paid either in money or also in seeds. Loans of this type are available for wheat, linseed, maize and now also for sunflower seeds and ground nuts.

Hence the farmers of Uruguay cannot complain of any lack of facilities for the obtaining of credit, so that really no new legislation on this matter would be necessary. Yet, nevertheless, complaints are made about the unnecessary splitting-up of agricul-

⁽¹⁾ See HANSON, *op. cit.*, pp. 82-85.

tural credit. Hence consideration is being given to the idea of setting up some central institute to take over all credit operations, the insurance of agricultural products and the giving of advice as regards markets, such an institute to take the form either of a special Agrarian and Industrial Bank or of an additional section of the State Bank, which latter would be the cheaper way. In their message of August 7, 1939 ⁽¹⁾ the President of the Republic, the Finance Minister and the Minister for Agriculture made detailed proposals regarding the organization and functions of this bank and laid a bill for its foundation before the Legislature. No decision has as yet, however, been taken on the matter.

Agricultural insurance.

The whole insurance business of Uruguay is in the hands of the State Insurance Bank (*Banco de Seguros del Estado*) which was founded by a law of December 27, 1911. Since July 19, 1926 the State insurance monopoly also covers all agricultural risks, hence also insurance against hail. Originally this form of insurance only applied to wheat, flax, maize oats and barley, but later it was extended to cover also vines and rice. In view of the great importance which oil-yielding plants have gained in recent years in Uruguay the insurance against hail has now in addition become applicable to sunflowers and ground-nuts

Social policy.

Several bills are to be dealt with by the Legislature concerning such matters as the raising of the standard of living and the rate of wages and the provision of old age pensions for agricultural workers, the improvement of rural housing conditions etc. Some of these measures have indeed already been discussed at great length, without, however, any decisions having as yet resulted

A LENZ

BIBLIOGRAPHY ON ECONOMIC AND SOCIOLOGICAL SUBJECTS

HANKE, L. and D'EÇA, R. — *Handbook of Latin American Studies*, 1938. Edited for the Committee on Latin American studies of the American Council of Learned Societies. Cambridge, Mass., Harvard University Press, 1939. XVI, 469 pp. \$ 4

This volume, which like its predecessor of 1936 was published by the good offices of the Committee on Latin American Studies and the American Council of Learned Societies, is a general survey of the literature on the scientific work of Central and South American countries. The compilers' aim is to give readers a selected list, with annotations, of the most important works on each branch of the sciences, and in this way a brief but comprehensive review of each subject is given. The treatment is systematic and a general introductory bibliography is followed by chapters dealing with special subjects, with subdivisions referring to countries.

A considerable part of the book deals with economic questions (pp. 78—158), the material on this subject covering three chapters which refer to Brazil, the other South

⁽¹⁾ *Diario Oficial*, No. 9888, August 18, 1939

American countries and the Caribbean area. This section contains much material of agricultural interest. Another important section is that dealing with geography (pp. 172-218), which contains a great deal of information of interest both to economists and to agriculturalists. Finally, mention should be made of a section treating of German immigration and settlement in southern Brazil.

For most of the books and articles resumé, sometimes quite full, are appended, in this way giving an idea of the contents of the publication.

An alphabetical index simplifies employment of this book, which should prove very serviceable, particularly as other bibliographies on Latin America are few and rather incomplete.

V. C.

La politique commerciale de la France by RENÉ HOFFHERR with the aid of Rev. Father DILLARD, A. GIBERT, J. NAUDIN, L. ROSENSTOCK-FRANCK, J. TABBÉ DE SAINT HARDOUIN, PHILIPPE SCHWOB, under the chairmanship of ALBERT DEMANGEON. Centre d'Études de Politique Étrangère. Work of a study group. Publication No. XI. Paul Hartman, Paris, pp. 378.

In the first part of this volume M. René Hoffherr considers the present position of France's commercial policy and the means of adapting it best to modern requirements. The second part is the work of M. René Hoffherr's collaborators and consists of six chapters on the statistical data for French foreign trade, the economic, monetary and political factors, and the legal and administrative mechanism of French policy. The last chapter treats of the recent developments in this policy.

As regards the first part, the author of the general survey after giving a detailed account of France's foreign trade arrives at the conclusion that internal and external obstacles and the fear of war in Europe are very disturbing factors in the way of any healthy commercial policy, and that the measures taken by the authorities responsible for French commercial policy have provided no permanent solution to these difficulties. Political considerations of both an internal and external nature have obliged France to adapt her policy to certain necessities deriving from agreements which "frequently confirm the supremacy of political over economic factors and try, not without difficulty, to secure the working together of essentially liberal economies and authoritarian economies". According to the author French economic policy must be directed especially towards the elimination of superfluous imports, the creation of a greater degree of competition between the suppliers of raw materials "whilst at the same time granting facilities for the import of goods from the French colonies", the bridging of the gap which separates the autarchic countries from those with liberal tendencies, and finally a more effective co-ordination of the interests of the various government departments.

It may be said that these principles also constitute the basis of the articles in the second part of the work. The last chapter on recent developments in French policy deals with the agreements concluded with the various countries and the difficulties arising in the course of their negotiation. The impression received from a reading of this chapter is that the negotiators were always haunted by the knowledge that they were working on something very precarious, the carrying out of which depended on many political circumstances and on the development of the international situation.

V. F.

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MONTHLY BULLETIN

OF

AGRICULTURAL ECONOMICS AND SOCIOLOGY

THE COURSE OF AGRICULTURAL PRICES AND COSTS IN 1938-39.

CONTENTS: *The course of agricultural prices.* The world market prices of agricultural products. Changes in price relationships and their effects upon agricultural countries. Agricultural prices on regulated national markets in relation to world market prices. — *Agricultural prices and costs.* Factors affecting the evolution of price-costs ratios. The evolution of price-costs ratios in different countries.

Throughout the year 1938-39 economic life in the world was increasingly dominated by the growing international tension, which ultimately resolved itself, in September 1939, in the outbreak of the European war.

The political situation led everywhere to the extension of government intervention and control which, in the course of the preceding few years, had already made deep inroads into all branches of economic activity. Economic energies and resources were being increasingly diverted to rearmament and preparation for war. Autarchic tendencies were greatly strengthened.

National planning, especially when it has economic autarchy for its ultimate object, necessarily involves the strict regulation of foreign trade and the emergence of more or less autonomous price systems. In international economic relations national planning also implies the fitting of international trade into the general scheme of planned national economy by bilateral agreements between the countries concerned. On the basis of these contractual economic relations there arises a solidarity of interests between the parties to such agreements, and regional economic groupings may be evolved, the exchanges within which tend to develop into regional markets, with regional price systems of their own.

At the same time, greatly as competitive international trade has been affected by the extension of economic nationalism and the constitution of regional and imperial economic blocs, it still accounts for the greater part of exchanges in the world. According to an estimate by the United States Department of Commerce, the trade between countries adhering in the main to competitive methods represented in 1937 about 70 per cent. of the total turnover of world trade. This estimate may be somewhat exaggerated, as it refers to the *total* trade of the countries generally operating on a competitive basis, while some

NOTE. We publish here an extract from the volume *The World Agricultural Situation in 1938-39*, which has just appeared.

of the trade even of such countries, especially when carried on with the nations whose trade is strictly controlled and regulated, cannot properly be described as competitive. Yet, on the whole, this figure should be accepted as showing that the world market, as distinguished by triangular competitive trade, far from having ceased to exist, still accounts for the greater part of the business transacted between nations.

Thus in discussing agricultural prices, it is necessary to consider the simultaneous existence of several more or less independent price systems, and to study the structure and movements of prices on the world market on the one hand, and on the several national and regional markets on the other hand.

What is true of prices is equally true of the costs of production. In a system of planned economy the problem of costs assumes a very different aspect from the one it has in an economic system ruled by competition. While in the latter costs have to be adapted to prices, in the former the price-costs ratio is maintained by a deliberate price policy. This policy mostly combines the fixation of "remunerative" or "fair" prices with expédients aimed at keeping down costs, such as the control of supply of the means of production, the provision of cheap credit facilities and so on. According to the structure and policies of the several national economies and to the conditions prevailing in the different regional groups, more or less effectively isolated from outside influences, the trends of evolution of price-costs ratios, and consequently of the incomes of the producers, also tend to diverge considerably.

The Course of Agricultural Prices.

As a basis for our study of the evolution of agricultural prices on the world market during the period under review we shall take the gold prices of the principal agricultural products on the most representative markets.

The table on the following page shows how general and pronounced was the depression in the prices of agricultural products during the years 1937-38 and 1938-39.

The decline in the prices of the principal *cereals*, particularly wheat, was mostly due to the plentiful crops of these two seasons. The stocks of wheat in the principal exporting countries at the close of the agricultural year 1938-39 were roughly twice as large as those of the corresponding period of the preceding year and were considerably in excess of the average of the preceding decade, when they had reached record figures. The resumption of large scale exports by the United States and the inauguration by the Federal Government, in 1938, of an extensive programme of subsidized exports of wheat, also contributed to the depression of world market prices not only of wheat, but, by repercussion, of other cereals as well. The pressure of supplies was, indeed, so heavy that even the large increase in demand on the part of some countries, particularly Germany and the United Kingdom, due to the building-up of emergency reserves, could not stem the decline.

In the case of the principal *animal products*, supplies were increased by the improvement in fodder conditions in 1937-38 and 1938-39, due partly to more

Average Prices of Agricultural Products.

(Gold francs per quintal)

	1936	1937		1938		1939
	July-Dec.	Jan.-June	July-Dec.	Jan.-June	July-Dec.	Jan.-June
<i>Wheat:</i>						
Manitoba No. 1, London and Liverpool	14.05	17.00	18.28	16.93	9.46	8.74
Hard Winter No. 2, Chicago	13.71	15.22	12.41	10.38	7.64	8.34
Barletta, Buenos Aires	11.40	12.81	14.35	11.35	6.95	6.69
<i>Rye:</i>						
No. 2, Minneapolis	10.61	13.11	9.22	7.85	5.15	5.55
Home grown, Warsaw	9.73	14.31	13.99	12.50	9.11	8.72
<i>Barley:</i>						
Fodder No. 2, Minneapolis	10.97	10.81	7.76	7.64	6.60	6.02
Danubian, Antwerp	10.04	11.74	11.22	11.10	8.42	7.73
<i>Oats:</i>						
White No. 2, Chicago	9.67	11.13	7.38	6.79	5.89	7.05
White No. 2, Buenos Aires	6.04	6.55	6.28	6.63	5.39	4.25
<i>Maize:</i>						
La Plata, yellow, London and Liverpool	7.71	8.73	9.63	9.59	8.38	7.97
Yellow, No. 3, Chicago	12.88	14.62	10.16	7.01	6.16	6.01
<i>Meat:</i>						
Argentine beef, chilled, London	82.78	84.10	92.08	91.07	90.09	83.10
Argentine mutton, chilled, London	60.74	60.91	62.50	61.92	56.77	49.39
<i>Bacon:</i>						
Danish, London	142.87	133.83	146.47	150.78	141.78	135.23
<i>Butter:</i>						
Danish, London	183.25	172.24	206.46	189.74	192.95	186.78
<i>Cheese:</i>						
Edam 40, Alkmaar	64.35	65.48	72.48	70.74	72.90	59.62
<i>Eggs:</i>						
Danish, London	8.87	6.28	9.14	7.05	8.63	6.06
<i>Tea:</i>						
Ordinary Ceylon Pekoe, London, per kg.	1.61	1.89	1.96	1.88	1.68	1.68
<i>Coffee:</i>						
Santos No. 4, New York	67.50	77.39	71.31	52.36	53.41	50.47
<i>Cacao:</i>						
Accra, London	55.05	67.65	48.03	41.10	34.07	30.37
<i>Sugar:</i>						
96°, London	6.90	9.43	9.57	7.91	7.97	9.82
Raw 88°, Prague	5.73	7.73	8.21	7.04	7.07	8.46
<i>Cotton:</i>						
Middling, Liverpool	97.01	102.14	74.84	68.22	67.46	69.28
Broach, Liverpool	77.40	81.64	61.91	55.02	52.11	52.20
Sakellaridis, Liverpool	149.91	151.69	122.04	112.62	107.34	89.65
<i>Wool:</i>						
Fine crossbred, London	380.20	446.88	395.92	303.45	285.75	254.63
<i>Rubber:</i>						
Plantation, sheet, New York	117.22	147.84	115.43	89.19	109.73	108.89

favourable weather, and partly to the fall in the price of cereal feeds. Moreover, the leading exporting countries took various measures for encouraging the export of these products.

Among colonial products, *sugar* was an exception to the general rule, as its prices improved in 1938-39 compared with 1937-38. This improvement was owing partly to the reductions of sugar export quotas by the International Sugar Council, and partly to increased purchases by certain countries for storage. As a result of this improvement, and in view of unfavourable forecasts for the 1939-40 crops, the sugar quotas were again raised in May 1939. *Tea* prices remained substantially unchanged, the conditions of the tea market being closely watched by the International Tea Council, representing the three principal exporting countries—India, Ceylon and the Netherlands Indies—which fixed quotas in accordance with the situation of production, consumption and stocks. The export quotas, which were fixed at 87.5 per cent. of the standard rates for 1937-38, were raised to 92.5 per cent. for 1938-39. For the year 1939-40 they were again reduced to 90 per cent. *Coffee* prices have suffered a severe fall since the close of 1937, following the abandonment by Brazil of her drastic policy of restriction of exports after the failure of the Havana Conference to arrive at an agreement between the leading exporters. The price fall, very sharp at the outset, has, however, been checked since by an extension of demand due to lower prices.

With regard to raw materials for the textile industries and to rubber, various factors have been at work in determining the course of their prices.

The conditions of the *cotton* market in 1938-39 depended mainly on the situation in the United States, where the exceptionally abundant crop of 1937, followed by another good one in 1938, combined with the industrial recession in depressing the prices of cotton. Large stocks accumulated as a result of loans granted to growers under the A. A. A. of 1938. World demand for cotton, on the other hand, was reduced by the drawing on stocks in the United Kingdom and in Japan and by the decline in the activity of the cotton industry in these countries and in the United States. Moreover, the continuous accentuation of autarchic tendencies involved the rapid extension of the use of artificial fibre, as well as an expansion of cotton-growing in many countries. In 1939 there came a slight revival of demand, followed by an improvement in prices, mostly owing to military orders and to the building up of emergency reserves. The market, however, remained in a depressed condition. In the case of Egyptian cotton prices continued to fall heavily, this decline being attributed to extensive bear speculation. *Wool* prices also fell considerably in 1938-39, mainly owing to the pressure of large stocks accumulated from the preceding years, during which the demand was sluggish. Here, as with cotton, autarchic tendencies and the development of substitutes aggravated the situation on the world market. In the course of 1938-39 the demand tended to increase, mainly owing to military orders, but the existence of large stocks on top of current production continued to depress prices.

The world *rubber* market is generally dominated by the demand of the United States, and the industrial recession there in 1937-38 was followed by an exceedingly heavy fall in the prices of rubber. In the course of 1938 the

International Rubber Committee was compelled repeatedly to reduce the export quotas, which were fixed for the third quarter of 1938 at the unprecedentedly low level of 45 per cent. of the basic rates. When the industrial revival in the United States in the second half of 1938 increased the demand, and considerable purchases were made by other countries for military requirements, the quotas were raised to 50 per cent. (November 1938). Fresh increases in May and July 1939 brought them up to 60 per cent. The market, though still depressed, was relatively steady. For the first time since the inauguration of the international restriction scheme in 1934, certain relaxations were made by the Committee in the restrictions upon cultivation and replanting for the 1939 and 1940 campaigns.

In considering the movement of gold prices on the world market during the period under review, it should be noted that in the course of 1938-39 many currencies suffered some depreciation in terms of gold, and that, therefore, the fall in gold prices in the countries concerned was somewhat accentuated. This refers in the first instance to the United Kingdom and to the whole "sterling group"; the same is true also for France, Japan, the Netherlands, Rumania, Yugoslavia and some other countries, including Argentina.

The rupture in the balance of the price system, which is unavoidable during periods of economic dislocation, has been a marked feature of the two agricultural years following the recession of 1937. While, during the period of economic revival, from 1933 to the 1937 boom, the prices of foodstuffs and raw materials had been steadily rising, relatively to the prices of manufactured goods, thus putting the primary producers in an advantageous situation, after the recession of 1937-38 the price relationships changed abruptly. While the gold prices of manufactured goods declined but very little between 1937 and 1938, their index number (1929 = 100) only having fallen from 51 to 50.5, foodstuffs and raw materials entering international trade fell respectively from 45.5 to 43 and from 47 to 42.5. The barter terms of world trade turned against the countries exporting agricultural and other primary products. In the course of the first half of 1939 the situation in this respect, if anything, probably became worse, considering that, as the preceding table shows, the course of agricultural prices on the world market continued downwards, while the demands made upon industry by rearmament and the consequent shifts in production and employment, as well as the rise in industrial costs, were increasing the prices of manufactured goods.

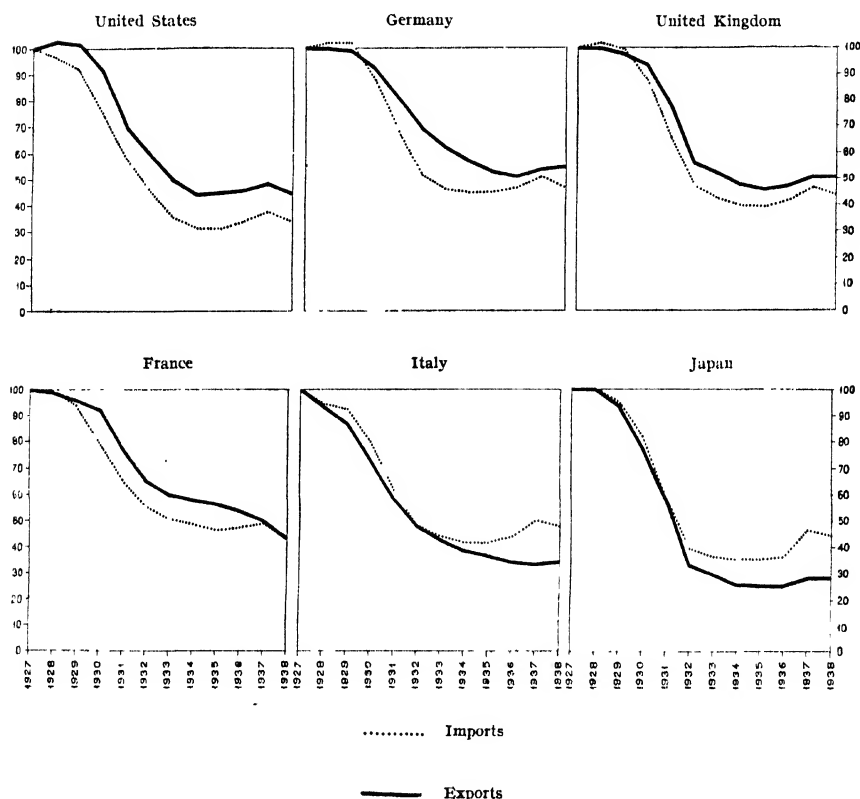
The position on the world market of the industrial countries, mainly exporting manufactured goods in exchange for primary products, on the one hand, and of the agricultural countries on the other hand, as affected by these changes in price relationships, is roughly illustrated in diagrams 1 and 2. These diagrams, based upon the tables of index numbers of the value, prices and quantum of imports and exports of a certain number of countries, published in the League of Nations' *Review of World Trade 1938*, though subject to important limita-

tions, give a sufficiently clear idea of the general trend of gold prices of the aggregate imports and exports of the respective countries ⁽¹⁾.

In the *United States*, the prices of imports and exports diverged up to 1929, the former falling and the latter rising, so that American producers were favoured

FIG. I. — *Evolution of Gold Prices of Imports and Exports in Industrial Countries.*

(1927 = 100)

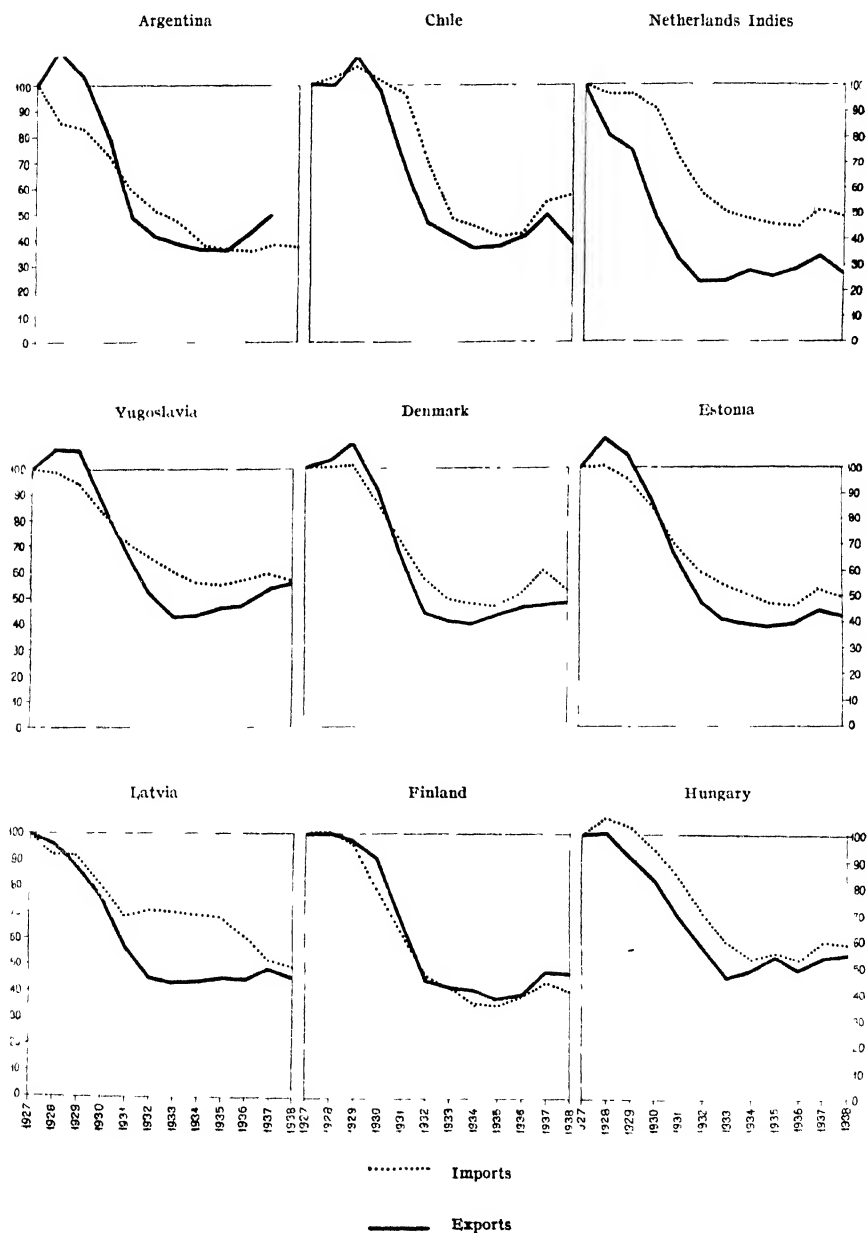


in exchange. Since 1929, both series declined apace until 1934, when they began to rise again on a parallel course. In 1937 there was a reaction, both imports and exports having depreciated on roughly parallel lines. Throughout the whole period since 1937 the index numbers of export prices have been keeping above those of the prices of imports, the latter having depreciated to a greater extent.

(1) For particulars concerning the methods of calculation see *Review of World Trade 1938* p. 65 seq.: "National Price and Quantum Indices of Imports and Exports".

FIG. 2. — *Evolution of Gold Prices of Imports and Exports in Agricultural Countries.*

(1927 = 100)



In the *United Kingdom* the evolution of prices of imports and exports after 1927 was very similar to that observed in the United States, the two curves, however, keeping closer together, as a result of the nature of the foreign trade of the United Kingdom, in which imports consist mostly of primary products, while exports are mainly manufactured goods. Prices in both groups had been rising between 1934 and 1937, the advance being somewhat more pronounced in imports, as the prices of primary products were then rising. In 1938 the prices of imports fell, while those of exports continued to rise slowly, the terms of trade thus turning in favour of the United Kingdom exporters.

In *France* the fall in the gold prices of both imports and exports was continuous until 1935, after which those of imports began to rise, while export prices continued to decline: an evolution which clearly reflected the depreciation of the franc and the rupture between the rate of exchange of French currency and its purchasing power on the internal market. The process of appreciation of imports, along with a depreciation of exports in terms of gold, continued, until the drastic financial and monetary reconstruction carried out in 1938-39 changed the situation in favour of the French exporter. It may be seen that if the evolution of gold prices of French imports and exports differed from that observed in other industrial countries, that divergence was fully accounted for by the conditions of French currency and their effects upon foreign trade.

In *Italy*, after a continuous decline in the prices of both imports and exports between 1927 and 1934, exports continued to depreciate slowly, while the gold prices of imports began to increase, the rise being sharpest in 1937. In 1938 there was a fall in the prices of imports, while export prices registered a slight improvement, to the advantage of the Italian balance of trade.

In *Germany*, gold prices for both imports and exports had been falling continually between 1929 and 1933, after which there was a slight upwards movement in those of imports, while those of exports continued to decline until 1936. In 1937, the prices of both imports and exports increased, the rise being more marked in the former. In 1938 a change took place in favour of the German exporter, as import prices dropped rather sharply, while export prices continued to rise slowly.

In *Japan*, the course of gold prices of imports and exports was much affected by currency measures aimed at encouraging exports. After a rapid decline between 1929 and 1932, between 1933 and 1936 the situation remained almost unchanged, but export prices fell more than did those of imported goods. In 1937 there was a sharp rise in the prices of imported goods, along with a slight improvement in those of exports. In 1938, the situation changed in favour of Japan, the prices of imported goods—mostly primary products—having declined, while those of exports continued to improve slowly.

Thus we can see that, in 1938, the evolution of price relations on the world market was generally favourable to the industrial countries, whose exports mainly consist of manufactured goods, which they exchange for foodstuffs and other primary products. From what we know of the movement of prices of the different groups of commodities during the months of 1939 preceding the outbreak

of the European war, this tendency ought to have continued throughout the agricultural year 1938-39, and may even have become accentuated.

As far as agricultural exporting countries are concerned, our information for recent years is rather scarce, but some characteristic cases can be quoted.

In the *Netherlands Indies* we have a country which is essentially dependent on the world market and very sensitive to its conditions. Here, the gold prices of both imports and exports, and more particularly those of the latter, had been falling rapidly during the years from 1927 to 1932, after which there was a halting recovery in export prices, accelerated between 1935 and 1937, under the influence of the revival in demand and of the restrictions imposed upon exports by the international schemes of control for rubber and tea. In 1938 there was a marked reaction, the prices going back to the level of 1935. Import prices continued to decline, though at a much reduced rate, between 1933 and 1936, after which they rose considerably in 1937. In 1938 they fell again slightly. The terms of trade during that year turned definitely against the Netherlands Indies.

In *Argentina*, another country vitally dependent on the world market, both import and export prices declined continuously between 1928 and 1935, after which there was a rapid rise in the gold prices of exports in 1936 and 1937. No figure is available for export prices in 1938, but considering the general trend of prices of the agricultural products which constitute the staple exports of Argentina, there was probably a considerable drop in the course of that year. Import prices declined till 1936, after which they recovered slightly in 1937 and registered a very slight reaction in 1938. From what can be inferred from the general trend of agricultural prices on the world market in 1938, it is likely that the terms of trade moved against the Argentine exporter.

In *Chile*, the gold prices of imports declined continuously between 1929 and 1935, and those of exports between 1929 and 1934. Then, both recovered till 1937, while in 1938 the prices of imports rose again and those of exports fell sharply to roughly the 1936 level, with adverse effects upon the balance of trade.

In Europe, data are available for Hungary, Yugoslavia, Denmark, Latvia, Estonia and Finland. Of these the two first named belong to the group of south-eastern countries, whose economic conditions in the course of the last few years have been increasingly influenced by the development of their contractual trade relations with their principal customers, and whose dependence upon the world market has been accordingly weakened. Denmark and the Baltic countries, though they were also affected to a certain extent by regional factors, still remained essentially dependent on the world market, owing to the part played in their foreign trade by the United Kingdom.

In *Hungary*, both import and export prices declined between 1928 and 1933, after which the prices of exports rose until 1935, fell again slightly in 1936, and recovered in 1937 and 1938. Import prices continued to fall till 1935; they rose considerably in 1936 and 1937 but then fell back slightly in 1938. The terms of trade during that year thus changed in favour of the Hungarian exporters.

In *Yugoslavia*, export prices declined continuously between 1928 and 1933, after which they rose steadily from 1934 to 1938. Import prices declined, though

at a much slower rate than those of exports, from 1927 to 1935, then rose slightly up to 1937 and declined again in 1938, thus moving in favour of the country.

Considering the general trend of commodity prices on the world market, particularly with regard to agricultural products, the recent evolution of price relations in these two countries, which would appear to confirm their relative immunity from the fluctuations of the world market, should probably be attributed to the effects of their contractual trade with their industrial neighbours.

In considering the evolution of prices of exports and imports in *Denmark* we must naturally take into account the fact that, by the nature of her agriculture, she is a large exporter of animal products and, at the same time, a large importer of cereals and fodder, so that agricultural products appear as essential items on both sides of her balance sheet. From what we see in the diagram, it would appear that Denmark profited in 1938 by a heavy fall in the prices of her imports, probably due in the first instance to the decline in the prices of cereals and feeding stuffs, accompanied by a slight increase in the price of her exports.

In *Estonia*, import and export prices moved along parallel lines during 1937, when both rose, and in 1938, when they fell again, the terms of trade thus remaining apparently unchanged.

In *Latvia*, the prices of both imports and exports fell from 1927 to 1931, after which they diverged sharply, to the detriment of the country. Import prices rose in 1932, while export prices continued to fall, reaching bottom in 1933. From 1933 on, the two curves began to converge slowly, and came close together in 1937. Both fell in 1938 to the same extent, but here, as in *Estonia*, export prices still remained relatively lower than those of imports, compared with the base year 1927. The only agricultural country in which the contrary was the case, and export prices have generally kept above those of imports, was *Finland*: this probably being due to the part played in her exports by non-agricultural products. In 1938 there was a slight reaction in exports prices, accompanied by a more pronounced fall in the prices of imports.

Fragmentary as they are, these few observations would appear to suggest, or rather to confirm, certain conclusions. The changes in the relations between the world market prices of the different groups of commodities—foodstuffs, raw materials and manufactured goods—during the period under review seem to have worked to the advantage of the industrial countries, at the expense of the countries exporting primary products. Among the agricultural exporting countries those wholly or mainly dependent upon the world market for the disposal of their exportable surpluses would appear to have been most adversely affected. The countries whose outlets were largely assured by bilateral trade agreements with their industrial partners—such as *Hungary* and *Yugoslavia*—would appear to have been more immune from the effects of changed price relationships on the world market.

This immunity is due to the fact that the countries with which they are in bilateral trade relations represent more or less isolated national markets with autonomous price levels generally above the level of world market prices.

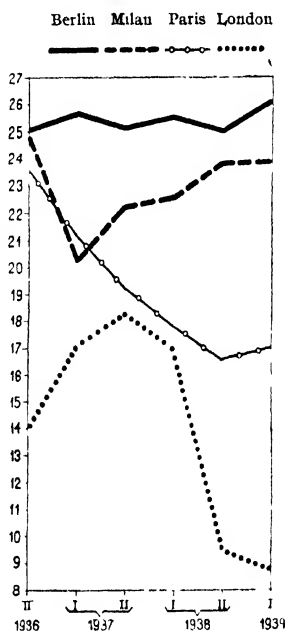
A glance at diagrams 3 and 4 showing the movement of gold prices of certain agricultural products on the principal closed national markets, compared with the evolution of world market prices of similar commodities, brings out very clearly the divergences in their levels and trends.

As representing world market prices of wheat, we take the half-yearly average prices of Manitoba No. 1 in London, in gold francs per quintal. During the three consecutive agricultural years 1936-37, 1937-38 and 1938-39, they varied within the very wide range between a maximum of 18.28 and a minimum of 8.46 gold francs. The sharp break in the price trend in 1938 is clearly apparent.

During the same period, wheat prices in Berlin were both much higher and much more stable, their variations being confined within the narrow limits of 24.95 and 26.10 gold francs per quintal. In Paris, the gold prices of wheat, apart from the measures of regulation of the wheat market, were largely affected by the conditions of French currency, which brought about a headlong decline in gold prices. This process was checked in 1938-39, during the later part of which year French wheat prices rose, while those on the world market declined. The variations of prices, which ranged between 16.54 and 23.68 gold francs per quintal, though far larger than those of German wheat prices, were smaller and less drastic in direction than those of the world market. In Italy the level of gold wheat prices was affected by the devaluation of the lira in October 1936, and later by the raising of wheat prices along with the general rise in commodity prices, not reflected in the rigidly fixed rates of exchange. The prices varied within the limits of 20.15 and 24.85 gold francs, but their trend was generally stable, and throughout the year 1938 it ran in a direction opposite to that of world prices.

Considering diagram 3 as a whole, we can see that the lowest level reached by gold wheat prices on the closed national markets during the last three agricultural years was practically always considerably above the highest limit of import prices on the world market in London, but that their stability, unless affected by general factors, such as the depreciation or devaluation of the national currencies, was very much greater. The dependence of the movement of prices on the closed markets upon purely national factors, as distinguished from the influence of the world market, is also clearly apparent.

FIG. 3. — *Prices of Wheat on certain Closed National Markets compared with World Market Prices, in gold francs per quintal.*

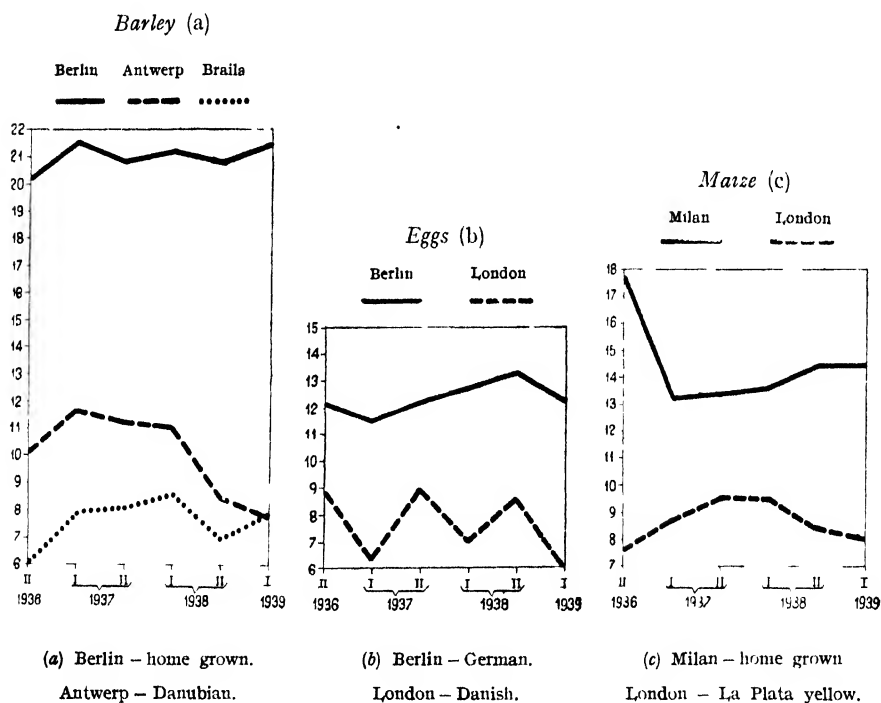


Note: For Berlin, Milan and Paris home grown; for London, Manitoba No. 1.

What has just been said of wheat prices applies equally to the prices of barley, maize and eggs, of which the movements are shown in diagram 4.

During the year 1938-39, as a result of the marked all-round decline in the prices of agricultural products on the world market, the gap between the world

FIG. 4. — *Prices of Barley, Maize and Eggs on certain Closed National Markets compared with World Market Prices, in gold francs per quintal for barley and maize and per 100 for eggs.*



market prices and the prices on closed and controlled national markets, has generally widened. One of the effects of this widening of the disparity of prices was to encourage the development of contractual trade relations of agricultural countries with those closed markets on which they could obtain better prices, at the expense of their competitive trade on the world market. Though this tendency was to a certain extent counteracted by the interest the agricultural exporting countries had in selling their products on free exchange markets, the advantages presented by higher prices on the closed markets, often combined with better barter terms assured by the agreements, undoubtedly favoured the progress of economic regionalism.

Agricultural Prices and Costs.

Having outlined the evolution of price relationships on the world market in its bearing upon the world agricultural situation, we shall now proceed to an examination of the course of prices of agricultural products in the different countries in relation to the costs of production.

While, in considering the conditions of the world market, we had to deal with gold prices, now our study will be based upon the evolution of prices in the several national currencies.

The course of prices in the different countries during the period under review was affected by a variety of factors, some of them general, and some peculiar to agriculture.

Among the general factors affecting prices in 1938-39 attention should be called in the first instance to the monetary situation, on which the financial strain of rearmament was beginning to tell. As we pointed out in one of our preceding surveys, in which the economic effects of rearmament were briefly discussed, even when rearmament is financed out of current taxation and does not involve an undue expansion of credit, its influence is essentially inflationary (¹). In dealing with the evolution of economic activity in the leading countries, we showed that, in 1938-39, rearmament reached a point at which it profoundly affected the economic system. Its economic and financial effects were beginning to be increasingly felt in the credit and currency systems, in the level of commodity prices, in the cost of living and in wages.

The effects of inflationary influences, indeed, were at first considerably attenuated by the state of low tension which had long existed in the economic system. Relatively heavy demands could be made for some time upon the credit machinery, without subjecting it to excessive strain, as large balances were lying idle and were available for investment at low interest rates. There were large stocks of raw materials for the industries and of finished products for the consumers, which could absorb the first influx of additional purchasing power without a significant inflation of commodity prices. On the labour market there was in many countries a vast reserve of unemployed, on which industrial expansion could draw for some time without producing an appreciable inflation in wages. The depression in agricultural prices, in so far as it was reflected in the retail prices of foodstuffs, tended to mitigate the effects of rearmament upon the cost of living of the masses, though its effects were to some extent neutralized by those of increased taxation.

Undoubtedly, for some time, all this helped to check the development of the inflationary tendencies set in motion by the execution of rearmament programmes. During 1938-39, however, clear symptoms of incipient inflation be-

(¹) See *The World Agricultural Situation in 1935-36*, Chapter I, pp. 46 sq., "The problems of economic expansion".

gan to appear in many countries, in the form of an expansion of credit and of monetary circulation, in the progressive depreciation of currencies in terms of gold and in the rise in the cost of living and in nominal wages. Wholesale prices, in spite of the depressing effect of the decline in the prices of agricultural products, also showed a tendency to rise in many countries, especially those in which the strain of rearmament was particularly great in relation to their resources, or where it had lasted longer.

While signs of inflation began to appear in the general level of prices of commodities and services, the price situation in agriculture was dominated by the conditions of supply and demand of agricultural products. With the exception of a few countries, in which supplies were relatively short, owing to poor crops, these conditions were such that prices, unless rigidly fixed or otherwise supported by government intervention, were bound to decline. The inflationary influences were not, as yet, sufficiently strong to overcome this depression of prices due to the relation between demand and supply on the agricultural markets. Accordingly, while the prices of other commodities and of services tended to rise, thus increasing the farmer's expenses, his receipts either diminished or, at the best, did not increase in proportion. The economic position of the farmers deteriorated accordingly, unless government intervention succeeded in keeping the price-costs ratio unchanged.

In the following pages we shall briefly survey the development of the relation between prices and costs in those countries for which some statistical data on this subject are available. The material at our disposal is admittedly scarce and highly heterogeneous. In some few cases we have index numbers of wholesale prices of agricultural products compared with indices of aggregate costs of production, and are thus in a position to draw more definite conclusions. In other cases we have indices of agricultural prices compared with those of certain elements of the costs, such as farm equipment, fertilizers or wages of agricultural labour. Here, our conclusions are far less certain and have to be supported by evidence derived from other sources. Finally, in some cases all we have are index numbers of prices of agricultural products on the one hand, and those of industrial products on the other hand. In these cases, the value of our comparison is mainly that of indirect demonstration of changes in the relative position of agriculture through the well-known phenomenon of "scissors". Treated with circumspection and projected against the background of the agricultural situation in the respective countries, these summary outlines of the evolution of price-costs ratios, illustrated by diagrams, serve to make the agricultural situation clearer.

Starting with the *United States*, we see from diagram 5 that the index numbers of agricultural prices in that country, which had been falling rapidly since the recession of 1937, recovered very slightly in the second half of 1938, only to fall again in the first half of 1939, reaching during the second quarter of that year the lowest level recorded since 1933. The index numbers of the prices of articles bought by the farmers have also been falling continuously since 1937, but at a very much slower rate than those of agricultural products. The disparity

between the prices received and the prices paid by the farmer, accordingly, increased rapidly during the recession of 1937-38. During the first half of 1938-39 the disparity diminished slightly, owing to the passing improvement in agricultural prices, but the fresh fall in the latter in 1939 widened it again. The trend of agricultural wages, apart from the usual seasonal fluctuations, continued upwards. It would appear, therefore—and this conclusion is confirmed by other evidence bearing upon the recent evolution of the agricultural situation in the

FIG. 5. — *Movement of Prices of Agricultural Products, of Articles Bought by the Farmers and of Agricultural Wages in the United States.*
(1909-10 to 1913-14 = 100)

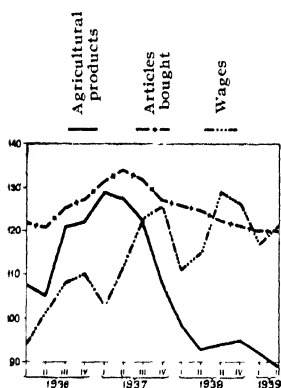
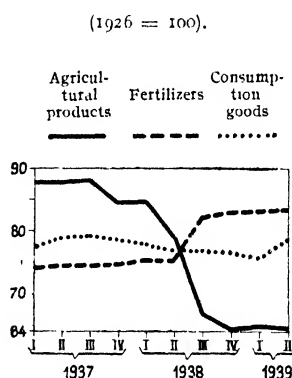


FIG. 6. — *Movement of Prices of Agricultural Products, Fertilizers and Consumption Goods in Canada*
(1926 = 100).



United States—that in the course of 1938-39 the relation between prices and costs in American agriculture was unfavourable to the farmers, and that the adverse change in the price-costs ratio was due, on the one hand, to the decline in the prices of agricultural products, rather than to a rise in those of other commodities, and, on the other hand, to a continuous increase in the wages of agricultural labour.

In *Canada*, as we see from diagram 6, agricultural prices, after a sharp fall during the recession of 1937-38, declined slightly in 1938-39. The goods for general consumption, exclusive of foodstuffs, showed no appreciable change either way, but the prices of fertilizers in 1938-39 rose considerably above the level of the preceding year. To a less marked extent than in the United States, the relationships between prices and costs in Canadian agriculture would appear to have also developed in a sense unfavourable to the farmers.

For *Argentina*, our diagram 7 shows the relations between the prices of agricultural products on the one hand, and of non-agricultural commodities on the other. Agricultural prices fell continuously between the closing

quarter of 1937 and the beginning of 1939, when a slight recovery took place, while the index numbers of prices of other commodities, after a considerable fall between the summer of 1937 and the summer of 1938, during the recession, rose slowly throughout the following nine months or so, the price relationships turning against agriculture.

Passing to Europe, for *Belgium* we have index numbers of prices of agricultural products and of total costs of production. Our diagram 8 reflects the

FIG. 7. — *Movement of Prices of Agricultural Products and Non-agricultural Commodities in Argentina.*

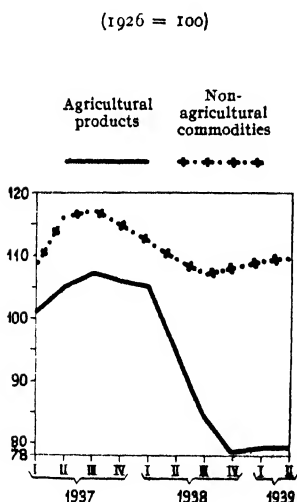
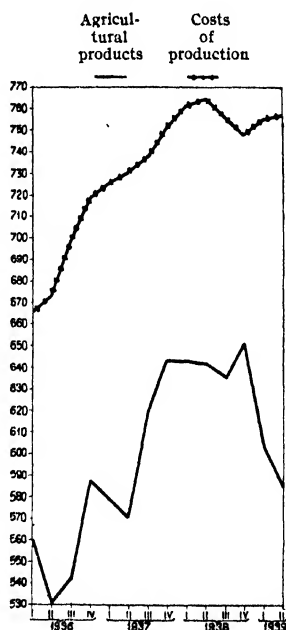


FIG. 8. — *Movement of Prices of Agricultural Products and of Cost of Production in Belgium.*

(1909-14 = 100).



difficulties of Belgian agriculture since the break in the upward trend of prices which took place in the second half of 1937. The costs of production continued to rise until the middle of 1938, as a result mainly of the increase in wages. A decline in other items of costs, however, caused the index of total costs of production to fall during the second half of 1938; but in 1939, with a general recovery in industrial production, and an increase in employment, there was a fresh rise. Agricultural prices continued to fall until the last quarter of 1938, after which they improved slightly, only to fall very sharply during the first half of 1939. Thus, after a brief improvement in the price-costs ratio at the end of 1938, the situation became exceedingly unfavourable for the farmers, with prices falling headlong, and costs increasing.

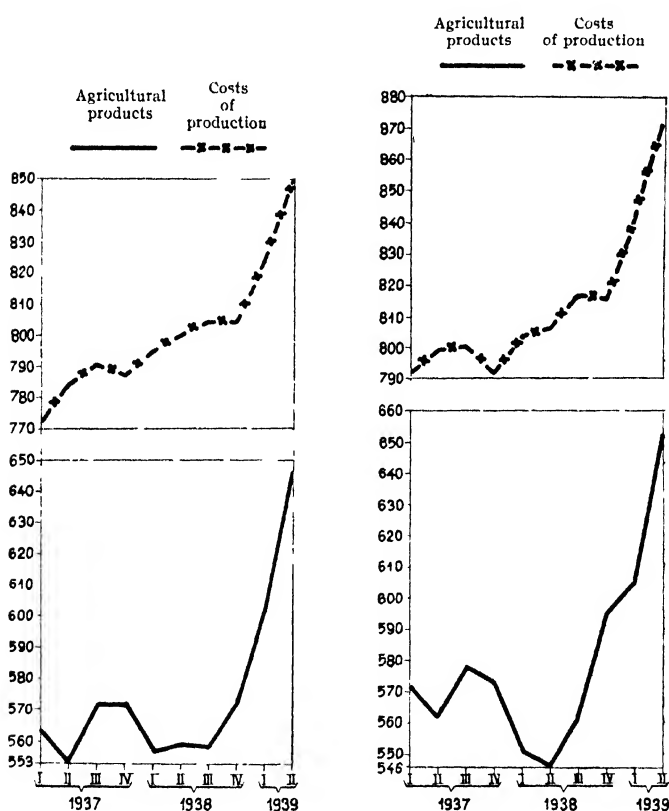
Another case in which the evolution of agricultural prices can be compared with that of total costs of production, is *Bohemia*, the subject of diagram 9. Here two different series of index numbers are available, the one referring to the sugar-beet region, and the other to that of other crops. In the sugar-

FIG 9. — *Movement of Prices of Agricultural Products and of total Costs of Production in Bohemia.*

(1913-14 = 100)

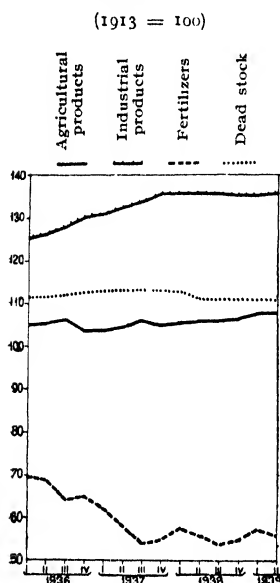
A. — *Sugar-beet region*

B. — *Non-sugar-beet region*



beet region, agricultural prices, after falling in 1937-38, rose continually throughout 1938-39. The costs of production also increased, but to a somewhat lesser extent, so that the price-costs ratio during that year moved in favour of the producers. In the region outside the sugar-beet zone, the development of the relationship between prices and costs was generally similar. Owing to the special conditions in which this country found itself in 1938-39, and which profoundly affected its economic life during the period under review, when it

FIG. 10. — *Movement of Prices of Industrial Products, of Chemical Fertilizers and of Dead Stock in Germany.*



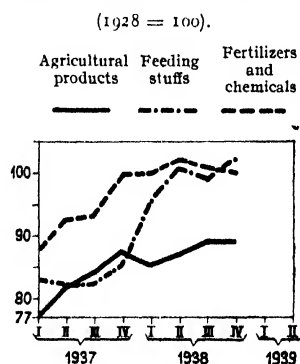
costs of production and of the necessities of the farmer's household in Germany, as shown in diagram 10, presents a picture of striking stability.

In Italy, agricultural prices have been rising continually since 1934, as have costs of production, though the latter have been increasing at a slower rate. The policy of the government, aiming at the highest possible degree of self sufficiency in essentials, has been consistently directed towards assuring to the farmer remunerative prices and lowering costs, with a view to enabling the standards of cultivation and the unit yields to be raised. As no figures have been published for 1939, our diagram 11 does not go beyond the last quarter of 1938. During the years 1937 and 1938 it reveals a fairly sustained rise in the prices of agricultural products and a relative stability in those of fertilizers and other chemical products. On the other hand, the prices of feeding-stuffs registered a marked increase, due to poor fodder crops during the recent years, thus pointing to the unfavourable position of animal husbandry compared with the other

passed through a period of violent upheavals, ending with its incorporation into Germany, the interpretation of these developments is, however, exceedingly difficult.

In Germany, the regulation and control of agricultural production and marketing, after having achieved, by 1935-36, equilibrium between prices and costs of production by means of a system of "fair" prices, has been persistently striving at a stable equilibrium in the price-costs ratio. While, during the earlier stage, the problem was to raise agricultural prices to a level at which the development of agricultural production could be assured, after 1935-36 it was sought, while continuing to make minor current adjustments in the prices of agricultural products, to avoid wider price variations, which would necessarily have disturbing effects upon the whole economic system. Accordingly, the price-costs ratio was stabilized mainly by acting upon costs, which it was sought to reduce by controlling the prices and supplies of the principal means of production, such as machinery, equipment and fertilizers. Accordingly, the evolution of relations between the prices of agricultural products and those of the various elements of the

FIG. 11. — *Movement of Prices of Agricultural Products, Feeding Stuffs, Fertilizers and Chemicals in Italy.*



branches of farming: a feature which has distinguished the recent development of Italian agriculture.

For *England and Wales* our diagram 12 is incomplete, as the index numbers of prices of agricultural products are now calculated with reference to the period 1927-29, instead of the years 1911-13, which still remain the basis of the indices for feeding stuffs and chemical fertilizers. In respect of the prices of agricultural products, however, it should be noted that their fall, which began in 1937, continued during 1938-39, the index numbers (1927-29 = 100) being 89 for 1937, 87 for 1938 and 85 for the first six months of 1939. The index numbers of prices of chemical fertilizers remained practically unchanged, save for insignificant fluctuations. The prices of feeding stuffs, on the other hand, declined sharply, thus reflecting the situation on the world market. This development was all to the advantage of animal husbandry, which represents the most important branch of British agriculture. It should be noted, however, that the dependence of British farmers upon current market prices for their products and their means of production has been greatly reduced by the recent policy of the government. While the British Government has generally avoided, as far as possible, any direct intervention involving the fixation of actual market prices of agricultural products, in the most vital branches of farming it intervened to assure fair returns to the producers. This has been done in various ways. First there are price guarantees for certain products, the most complete and characteristic being that introduced by the Wheat Act, 1932; then there are fixed-rate subsidies, paid irrespective of market prices, on certain products, the most important being that on fat cattle; and finally marketing organizations controlled by representatives of producers, but having statutory sanction, have in recent years been exercising price-supporting functions, the chief product concerned here being milk. This intervention has moreover also been extended by recent measures which reduce farmers' costs; thus the Agricultural Act 1937 provides for subsidies to cover 50 per cent. of the cost of lime and 25 per cent. of the cost of basic slag purchased by farmers.

Of the Scandinavian countries, *Sweden* would appear to have been the only one in which price relations in 1938-39 have developed in a sense favourable to the farmer. As may be seen from diagram 13, the trend of prices of agricultural products in Sweden has been in an upward direction, the index number for 1938-39 being 93, as against 92 in 1937-38. The prices of the means of production and of other articles bought by the farmers, on the other hand, have declined. In wages, however, there has been an increase.

In *Norway* the price-costs ratio developed in a sense unfavourable to the producers. Diagram 14 shows that the general index of prices of agricultural pro-

FIG. 12. — *Movement of Prices of Agricultural Products, of Feeding Stuffs and of Chemical Fertilizers in England and Wales.*

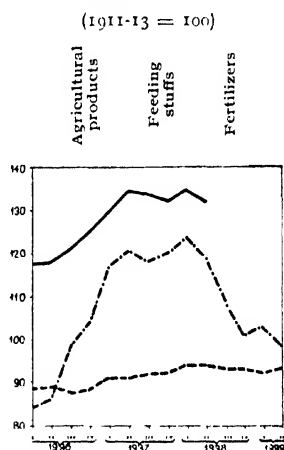


FIG. 13. — *Movement of Prices of Agricultural Products and of Articles Bought by Farmers in Sweden.*

(1909-13 = 100).

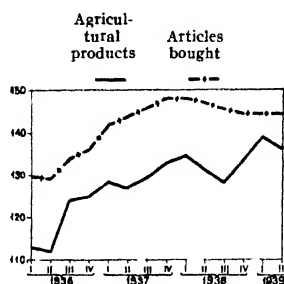


FIG. 14. — *Movement of Prices of Agricultural Products, of Means of Production and of Wages in Norway.*

(1909-14 = 100)

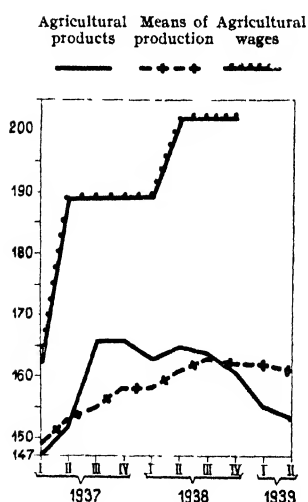
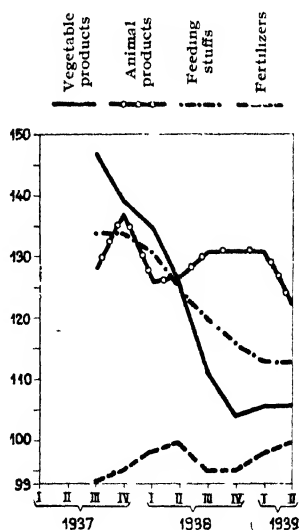


FIG. 15. — *Movement of Prices of Agricultural Products, Feeding Stuffs and Fertilizers in Denmark.*

(1909-14 = 100)



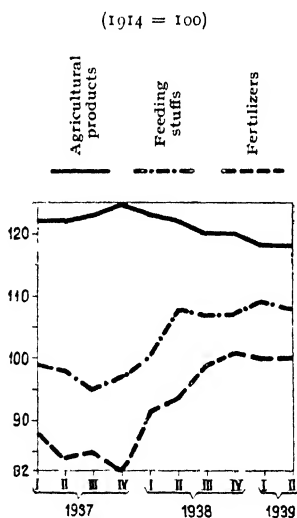
ducts registered a slight decline, the annual index in 1938-39 being 161, compared with 162 in 1937-38. The decline was fully accounted for by vegetable products, animal products having registered a slight improvement. The prices of farm equipment and other means of production rose and wages also increased.

In *Denmark*, to which diagram 15 refers, the situation was generally similar to that recorded for Norway. The index numbers of prices of agricultural products declined, the annual figure for 1938-39 being 126, compared with 128 in 1937-38. There has been a sharp fall in the prices of vegetable crops, while those of animal products remained on the whole unchanged, largely as a result of active intervention on the part of the government in favour of this branch of production, vital for Danish agriculture. With regard to the costs of production, the considerable decline in the prices of feeding-stuffs favoured the Danish farmers, but wages, prices of agricultural implements and building costs have all risen, the increase being particularly marked in wages.

In *Switzerland* the prices of agricultural products in 1938-39 were lower than in 1937-38, the fall being particularly marked in dairy products. The trend of prices of feeding-stuffs had been generally rising for some time past, and continued so in 1938-39, as can be seen from diagram 16. The prices of fertilizers also rose. The case of Switzerland, however, is one in which hasty conclusions, should not be drawn from the consideration of price movements, as the situation there is rather peculiar. Indeed, the rise in the prices of feeding stuffs in a country whose agriculture depends to so large an extent on dairy farming, would naturally suggest the conclusion that conditions were taking a clearly unfavourable turn. This, however, is not the case, since for some time past the policy of the government has been to discourage excessive concentration on dairy production, which was characteristic of Swiss agriculture, and to stimulate arable farming instead. With this object in view, measures were taken to limit the imports of feeding stuffs and to raise their prices, thus confining animal husbandry in the main to domestic fodder resources and encouraging a development of arable crops. Accordingly, the increase in the prices of feeding stuffs would appear to be part of a deliberate policy. On the other hand, the increase in the cost of fertilizers seems under such conditions to represent a development definitely unfavourable to Swiss agriculture.

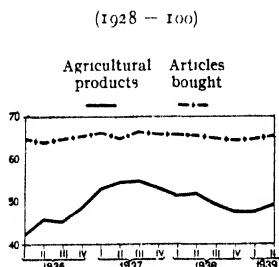
In *Poland*, to which diagram 17 refers, the prices of agricultural products in 1938-39 were somewhat lower than in 1937-38, during which year they had reached a relatively high level. This was due to a good season, which brought

FIG. 16. — Movement of Prices of Agricultural Products, Feeding Stuffs and Fertilizers in Switzerland.



large supplies to market, to the fall in world prices and to the continuance by Poland of a deflationary policy, necessitated by adherence to the gold standard.

FIG. 17. — *Movement of Prices of Agricultural Products and of Articles Bought by the Farmers in Poland.*



The prices of the commodities bought by the farmers also declined, though to a lesser extent than those of agricultural products. Accordingly, the price-costs ratio would appear to have taken a somewhat unfavourable turn for the producers, but, as in the past, the variations in price relationships were relatively slight.

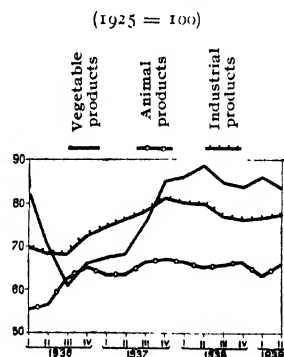
In *Yugoslavia*, the prices of vegetable products were lower in 1938-39 than in 1937-38, while those of animal products remained substantially unchanged. Diagram 18 shows that the fall in the prices of vegetal products, however, was very slight, as compared with that in world market prices. If we recall the disastrous effects upon Yugoslav agriculture of the depression of 1929-32, we cannot help being impressed by the relative stability it has acquired since. This stability

would appear to be due partly to the measures of assistance and regulation taken by the government, but to a large extent it is also due to the effects of bilateral agreements concluded by Yugoslavia with her principal customers. These agreements have not only assured to Yugoslav agriculture more favourable terms of exchange than those offered by the world market, but also facilitated, and even directly encouraged, certain essential changes in production, which made her farming less dependent on a few staples of which the prices on the world market were more or less permanently depressed. The prices of industrial products in Yugoslavia in 1938-39 moved along lines roughly parallel to those followed by her agricultural products.

For other countries we are not in a position to illustrate graphically the evolution of price-costs ratios during the period under review, no sufficient statistical data being available.

In *France*, on the whole, in spite of increased production, the prices of agricultural products have been fairly stable. Indeed, the index number of prices of agricultural products and foodstuffs (1913 = 100), which was 327 in 1935, 426 in 1936, 562 in 1937 and 641 in 1938, in the course of 1938-39 reflected the general stability given to French economy by the economic and financial policy of that period. Apart from momentary variations, mainly due to seasonal ups and downs of supply and demand, the indices displayed no significant changes, and in July 1939 the monthly index was 629, against 630 in July 1938. Industrial

FIG. 18. — *Movement of Prices of Agricultural Products and of Industrial Products in Yugoslavia.*



products, indeed, increased in price somewhat during the same period, their index in July 1939 being 721, compared with 671 in July 1938. Yet the increase in the prices of articles purchased by the farmers, such as machinery and farm equipment, has been moderate compared with that which took place in the preceding years, and wages were stabilized.

In the *Netherlands*, the situation of the farmers was unfavourably affected by the combination of a decline in the prices of agricultural products with an increase in the cost of labour. The prices of vegetable products, as expressed in index numbers (1925-26 to 1928-29 = 100) fell from 63 in 1937-38 to 59 in 1938-39, and those of animal products from 66 to 63. The general index number of agricultural products fell during the same period from 65 to 62. This decline reflected conditions on the world market, upon which Dutch agriculture is vitally dependent. The index number of agricultural wages, which stood at 68 in 1937 and the first quarter of 1938, then began to increase, owing to the expansion of industrial activity in the country, largely due to armaments, until, in the second quarter of 1939 it reached 75.

GEORGE PAVLOVSKY

INTERNATIONAL CHRONICLE OF AGRICULTURE

BELGIUM

The questions which have attracted most attention in this country since the outbreak of hostilities are those concerning the formation of stocks of raw materials and products of prime necessity, the adjustment of agricultural production in order to ensure self-sufficiency as regards foodstuffs and finally, the organization of imports from the double standpoint of continuity and certainty of supplies

Price Indices of Vegetal Products.

(1936 = 100)

	1937	1938	1939	January 1940	February 1940
Wheat	122	107 4	106 1	132 2	134 9
Rye	147 5	108 4	93 6	156 1	103 2
Winter barley	133	105 6	109	186 5	191 4
Oats	127	107 8	87 9	125 8	131 9
Straw	130 5	124 9	136 6	254	298 3
Sugar-beet	117	110 5	118 8	125 5	128 0
Potatoes	87 5	90 4	74 4	100 2	113 6
General index . . .	112 4	104 4	96	136 8	148 2

Belgian agriculture can satisfy between 80 and 85 per cent. of the country's needs, but certain foodstuffs and articles of paramount importance such as wheat and animal feeds have to be imported in large quantities.

A consideration of the agricultural index recently compiled by the Ministry of Agriculture (1936 average prices = 100) will give an idea of the evolution of agriculture from the economic standpoint. The year selected as a basis for the index is considered as fairly normal in that it was comparatively satisfactory for the producer. In calculating the indices the effect on the figures of seasonal price variations has been taken into account and eliminated.

The tables on this and the preceding page show the average market price indices of animal and vegetal products and of production costs during the past three years and the first two months of 1940.

In February, 1940, the increase in the average index of vegetal products amounted to 35.8 points above that for the year 1937.

Price Indices of Animal Products.

(1936 = 100)

	1937	1938	1939	January 1940	February 1940
Bullocks	107	105.4	106.6	115.1	112.9
Cows	105.5	106.5	106.7	112.9	112.6
Calves	111.5	120.8	113.2	124.4	114.3
Pigs	94	131.2	116.4	104.5	102.2
Butter	120	122.6	109.7	122.3	118.8
Eggs	102	114.3	108.8	115.8	180.8
General index . . .	108.4	118.8	109.6	115.3	124.7

Thus the market price indices for agricultural products increased considerably in the sector of vegetal products, rising from an average of 96 for the whole year 1939 to 148.2 in February 1940. On the other hand the rise was much less marked in the case of animal products, the index number only having risen from 109.6 for 1939 as a whole to 124.7 in February 1940.

To obtain an exact idea of the agricultural situation from a comparison of these indices, it must, however, be remembered that vegetal products provide less than one third of the total receipts from farm products. Conditions are fairly critical in live-stock farming and milk production and this is explained by certain elements of the costs of production, as may be seen from the following table showing the costs of production index for the same periods as in the tables shown above.

Compared with the average index for the year 1937, the index for February 1940 showed an increase of 14.8 points, the price of feeding stuffs for cattle showing a particularly marked rise—from 119 in 1939 to 167.0 for February 1940. Taxes also increased considerably, their index rising from 106.3, the 1939 average, to 126.2 for February 1940. The increase was less marked in the case of outlay for equipment, the indices being 108.5 and 117.6 respectively, while general expenses rose from 113.3 to 126.1.

The difference between the profitability of farms in regions where animal production and dairying predominate and that of farms in areas where vegetal production

prevails, suggests that, in the absence of counter-measures there will be a decline in stockbreeding in favour of arable farming. The government has indeed already adopted several measures to check the current trend, some of which will be described below.

Index Numbers of Costs of Production in Live-stock Farming.

(1936 = 100)

	1937	1938	1939	January 1940	February 1940
Rent	102 1	102 3	105 7	106 3	106 3
Wages	107 3	109 4	112 5	113 1	113 1
Fertilizers	102 8	108 5	109 5	113 7	112.1
Feeding stuffs for cattle	121 7	127 7	119	161 3	167 0
Plants, seeds	98	95.1	85 7	87 4	105.7
Equipment	106 3	108 5	108 5	117.6	117.6
Taxes	104 9	107 5	106 3	124 6	126 2
General expenses	107 1	111	113 3	123 4	126 1
General Index	108 1	111	111 3	121 4	122 9

External trade.

Development of external trade — Belgian foreign trade has altered radically in volume and in direction since the outbreak of hostilities. Partly as a result of the country's altered requirements, the whole structure of foreign trade has changed greatly. The following table shows the aggregate figures for Belgian trade, month by month, from September 1939 to February 1940, the figures for August 1939 are also given, as this was the last comparatively normal month. The importance of the changes which have occurred will be seen from this table.

Month	Imports	Exports
	(Million francs)	
1939: August	1,777	2,031
September	904	1,404
October	1,225	1,045
November	1,539	1,714
December	1,521	1,950
1940: January	1,271	1,715
February	1,476	1,877

Imports for the period from September 1, 1939, to February 29, 1940 totalled 7,936 million francs, while exports amounted to 10,365 millions. In the corresponding period of 1938-39 imports amounted to 11,493 millions and exports to 11,328 millions, so that the former have declined by 30.9 per cent. and the latter by 8.5 per cent.

The new trends observed in foreign trade are illustrated in the following table showing Belgian exports towards the principal markets, as compared with figures for the corresponding period of the previous year.

Destination	Period from September 1, 1938 to February 1, 1939		Period from September 1, 1939 to February 1, 1940	
	Value (Million francs)	Percentage of total exports	Value (Million francs)	Percentage of total exports
Germany	1,074	10 3	711	8 5
France	1,342	14 0	925	11 0
United Kingdom	1,253	13 0	990	11 9
Netherlands	1,210	12 9	1,729	20 7
Switzerland	276	2 8	568	6 7
United States	689	7 25	781	9 4
Argentina	338	3 5	272	3 2

From the above table, it may be seen that in general Belgian exports to the belligerent countries declined, especially those to Germany and France. Exports to the Netherlands and Switzerland, on the other hand, showed a marked increase, not only in relative but also in absolute value. The same may be said as regards the United States. A slight falling off may be observed in exports to Argentina.

The following is a similar table for imports:

Origin	Period from September 1, 1938 to February 1, 1939		Period from September 1, 1939 to February 1, 1940	
	Value (Million francs)	Percentage of total imports	Value (Million francs)	Percentage of total imports
Germany	1,071	11 0	756	12 1
France	1,527	15 8	933	15 0
Netherlands	955	9 9	647	10 3
United Kingdom	805	8 3	493	7 9
Switzerland	107	1 1	88	1 4
United States	938	9 7	644	10 3
Argentina	356	3 6	592	9 4

The variations are much less marked than in the case of exports, the different countries showing little alteration in their relative values, although a marked increase is registered in imports from Argentina.

The movement of imports of raw materials and manufactured goods since the commencement of the war is given in the following table; the figures for August 1939 are

also shown as they enable a comparison to be made with the last month in which the situation was normal:

Month	Raw or merely prepared materials	Manufactured goods
	(Quintals)	
1939: August	24,692,425	521,429
September	14,951,194	308,648
October	17,959,705	411,313
November	18,771,453	460,591
December	16,721,418	518,179
1940: January	13,019,579	345,294

Lastly, the following figures show the Belgian foreign trade situation in February 1940, the last month for which figures are available:

Country	Imports	Exports
	(Thousand francs)	
Germany	111,662	115,848
France	194,121	332,213
United Kingdom	179,651	238,511
Netherlands	135,119	242,878
Switzerland	22,295	136,511
United States	102,405	196,368
Argentina	155,801	55,138
	1,475,810	1,876,522

The trade balance as a whole remains strongly in favour of Belgium and trade with each of the three belligerents is also in her favour.

Regulation of external trade. - - The principles governing Belgian trade policy since the outbreak of hostilities were laid down in two agreements with France and the United Kingdom, dated respectively December 11, 1939 and February 13, 1940. They are as follows:

(1) An absolute embargo has been placed on the export of certain goods essential to the Belgian economy and the requirements of the population. Included in the list are cereals, feeding stuffs and straw, livestock with the exception of horses, fresh meats with the exception of pigmeat, margarine and prepared edible fats, pig fats, unwashed wool, raw or ginned cotton and jute.

(2) Certain other goods can only be exported to the belligerent countries in quantities equal to the normal amounts exported in the period from 1936 to 1938.

Included in these groups are cereal flours and starches (feculas), alimentary pastes, cereal by-products, dried legumes, preserved meat, fresh, frozen or tinned fish, fresh milk and cream, cheese, fish oils and fats, vegetal oils and fats, edible fats obtained from cattle, sheep and goats, oil seeds and fruits, sugar.

(3) Other goods again, such as several varieties of hides, carded and combed woollen yarns, cotton, jute, etc. can only be exported to the belligerent countries in smaller quantities than under normal conditions. The percentage of reduction varies considerably.

A special institution which has been founded to stimulate home and export trade in agricultural products will be described below.

Measures relating to the marketing of agricultural products.

The National Marketing Office for Agricultural and Horticultural Produce. — Most of the produce of Belgian agriculture is marketed within the country, only certain special items and any surplus stocks being exported. The first need is therefore to protect the home market and home production against abnormal foreign competition. Hence the institution of the quota and permit system, which has invariably been adjusted to meet the needs of the moment. It is also necessary to maintain and stimulate the export outlets already in existence and to seek new foreign markets. A non-profit-seeking institution was founded in 1933 called the "Association for the Development of Agricultural and Horticultural Markets". Though a private concern, this body worked in collaboration with the Ministry of Agriculture and was appointed by the latter to control exports of horticultural and market garden produce in particular. But the changes in economic conditions since 1933 made it advisable to replace the private institution by a public body, so that the National Marketing Office for Agricultural and Horticultural Produce was created by the law of December 27, 1928 ⁽¹⁾. The purpose of this institution is to assist the Ministry of Agriculture in stimulating the creation of home and foreign markets for Belgian agricultural and horticultural produce. It therefore gives information concerning trade prospects, carries out enquiries into home and foreign markets, awards premiums to encourage an improvement in the presentation and quality of products, arranges exhibitions and competitions and grants certificates guaranteeing the origin, quality and quantity of the products.

In application of this programme and in order to protect producers, distributors and consumers against every attempt to evade the usual standards required on the competitive market, the Ministry of Agriculture has been authorized to establish conditions with which agricultural produce must comply if it is to be marketed, and the Office appoints special representatives for this purpose.

The Supplies Department. — This department was instituted by the royal decree of February 8, 1940 ⁽²⁾, for the purpose of estimating the quantities of foodstuffs and produce required for human nutrition. Every request concerning the importation and exportation of such goods must pass through the new department, which also includes a section for the collection of all data on stocks and agricultural resources and another dealing with matters relating to trade and distribution.

⁽¹⁾ *Moniteur Belge*, No. 26, January 26, 1939.

⁽²⁾ *Moniteur Belge*, No. 49, February 18, 1940.

Measures relating to agricultural production.

Cereals. — In order to maintain equilibrium between the various farm crops, the growing of wheat has been encouraged during the past few years by subsidies from a valorization fund formed from the fees paid for wheat import permits. In 1938, for instance, producers of wheat, rye and barley were awarded premiums amounting respectively to 250, 450 and 550 francs per hectare sown to these cereals. Another measure adopted to stimulate wheat-growing makes compulsory the adding of a fixed percentage of home-grown wheat to all mixtures sent to be milled. The import duty on foreign wheat was removed on the outbreak of hostilities and replaced by a maximum price, but the ministerial decree on the fixing of this price was later abrogated. Prices are now fixed on the basis of market trends.

The economic conditions resulting from the war have made necessary the adoption of a measure whereby it becomes compulsory to sow greater areas to certain crops including wheat and rye (decree-law of September 23, 1939) ⁽¹⁾. In normal times Belgium consumes 14 million quintals of wheat per annum, but only produces between 3 ½ and 4 million, the remainder having to be imported. As the arrival of shipments is now exceedingly precarious, the dependence on foreign sources must be reduced as far as possible. The above-mentioned decree therefore establishes a 50 per cent. increase in the area sown to wheat during the crop year 1939-40 and a 40 per cent. increase for rye. Farms which are unable to comply with this regulation may, however, apply for exemption to the burgomaster of their commune (ministerial decree, October 5, 1939) ⁽²⁾. Exemptions may be either total or partial; the latter contemplate a reduction varying between 50 and 30 per cent. in the additional area to be sown to wheat and between 40 and 30 per cent. in the additional area to be sown to rye. The government has also given the communal commissions wide discretionary powers as regards the enforcement of this measure.

Other important provisions have been promulgated in connection with the preparation of wheat flours and the use and sale of homegrown wheat (decree-law, September 22, 1939) ⁽³⁾. The use of wheat as a feeding stuff for livestock is prohibited. All wheat sales must be effected through the National Marketing Office for Agricultural and Horticultural Produce, to which millers and grain merchants must apply for permits to purchase wheat. Every permit must bear the names and addresses of both the buyer and seller, the quantity purchased, the price paid per quintal and the date of purchase. The producer is authorized to retain the wheat necessary for future sowings on a basis of 150 kilogrammes per hectare sown and also to reserve the amount required to feed his household on the basis of 500 grammes daily per person.

Dairy produce. — During the past few years the government has devoted much study to the milk problem. Overproduction is the weak spot in this sector, due to an increase in the numbers of stock and in their yield. It is to the interest of both the producer and consumer that fluctuations in prices should be curbed. The National Office for Milk and Milk Products (*Office national du lait et de ses dérivés*) was created in January, 1938, for the purpose of organizing improved conditions in this branch of the Belgian economy. Within the Office five advisory commissions have been set up

⁽¹⁾ *Moniteur Belge*, No. 267, September 24, 1939.

⁽²⁾ *Moniteur Belge*, No. 280, October 7, 1939.

⁽³⁾ *Moniteur Belge*, No. 267, September 24, 1939.

devoted respectively to milk, butter, cheese, other milk products, instruction and propaganda. The functions of the Office were defined as follows: (a) official and optional supervision of butter, milk for direct consumption, Herve cheese, hard-crusted cheese and condensed milk; (b) supervision of the manufacture of powders of the Hatmaker type from whole milk; (c) fixing of normal prices to be paid to producers of dairy produce.

During the first year of its activity the Office devoted most of its attention to butter control, and butter factories the output of which was considered to be of sufficiently high quality were given an official trade mark. By December 31, 1939, 39 approved establishments were 'under the supervision of the Office and 26 had been awarded the official trade mark. The total annual output of these 26 establishments amounted to 5,400,000 kilogrammes of butter, or 18 per cent. of the total output of the country which is estimated at 30,000,000 kilogrammes.

A Central Commission for Dairy Produce to deal with the fixing of prices was created as part of the machinery of the Office in October, 1938. This commission instructs the regional commissions in such matters as the calculation of winter and summer prices for milk for direct consumption, the variations to be made in the price of milk according to its fat content, the calculation of the cost of production, etc.

The government has adopted two methods in attempting to eliminate some of the surplus milk which has glutted the market for some time, by establishing a cheesemaking and a powdered milk industry. The cheesemaking industry, which was only represented by a few producers scattered throughout the country, is now on a firm basis and manufactured 150,000 kilogrammes of hard crusted cheese in four months in 1939. Still more remarkable results have been obtained from the work accomplished as regards powdered milk. This industry was non-existent in 1935, but by 1939 the annual output totalled 800,000 kilogrammes, while the 1940 output will amount to 1 million kilogrammes or one quarter of the total Belgian consumption.

Another problem which has been solved is that of milk distribution. A royal decree dated July 27, 1939 (*) instituted compulsory permits authorizing the sale of milk for direct consumption. The permit is granted by the National Milk Office and the milk sold must have a minimum fat content of 30 grammes per litre.

G. COSTANZO

ROMANIA

During the period from August 1939 to April 1940 the economic situation of Romania was seriously affected by the international situation.

The repeated concentration of troops led to an increase in home consumption; production was affected by the shortage of labour; large sums had to be expended on national defence (armaments, equipment, etc.); the demand for export goods, chiefly agricultural produce, became increasingly great. There was a consequent upward trend in the prices of the majority of products. This upward movement is still in progress, the increase being much greater in the prices of industrial products than in those of agricultural produce.

(*) *Moniteur Belge*, No. 210, July 29, 1939.

The following table gives the indices and prices compiled by the "Romanian Association for the Study of the Trade Cycle":

Item	Unit	Year	August	September	October	November	December	January
General index of wholesale prices 1929=100		1939	84 0	88 9	92 0	98 9	104 3	—
		1938	76 6	77 2	76 0	78 3	80 5	—
		1937	80 3	78 9	79 2	78 5	78 7	—
Index of agricultural prices . 1929=100		1940	—	—	—	—	—	80 8
		1939	70 0	73 1	72 8	78 4	77 5	—
		1938	64 0	64 0	63 4	64 2	67 9	—
Index of industrial prices . . 1929=100		1939	99 6	104 9	112 4	119 9	132 2	—
		1938	86 9	90 8	90 7	93 0	93 9	—
		1937	97 5	94 5	95 5	95 4	93 6	—
Wheat, Braila	Lei/quint.	1940	—	—	—	—	—	474
		1939	424	442	437	432	467	—
		1938	410	390	384	391	412	—
Maize, Braila	Lei/quint.	1940	—	—	—	—	—	329
		1939	443	415	327	330	202	—
		1938	336	355	346	346	403	—
Barley, Braila	Lei/quint	1940	—	—	—	—	—	415
		1939	299	338	369	424	419	—
		1938	291	290	294	305	358	—
Rye, Braila	Lei/quint	1940	—	—	—	—	—	407
		1939	270	268	346	354	375	—
		1938	255	261	245	271	299	—

As the table shows, price indices of agricultural products only increased by 7.5 between August and December 1939, reaching 80.8 in January 1940, equivalent to an increase of 10.8 over the price index for August 1939.

Between August and December 1939, the price indices for industrial products showed an increase of 32.6, or three times the increase registered by agricultural produce. This is confirmed by a glance at the price per quintal of the principal cereals, and especially of wheat and maize, which showed very slight increases.

The area sown to wheat during the autumn of 1939 was much smaller than that for 1938. According to provisional figures, the area sown to wheat at the present time is estimated at 3,000,000 hectares, as against 3,800,000 hectares sown in 1938. This reduction in the area sown was due to unfavourable weather conditions. Sowings were hampered by much rain during the autumn of 1939, as was the preparation of fallow land for the spring crops. The winter of 1939-40 was extremely severe and the frost caused considerable loss to part of the autumn crops. The area under wheat was reduced by some 300,000 hectares due to this loss, while losses in the Danubian plain were still more severe.

There are some regions of Romania, such as southern Bessarabia, where spring wheat is cultivated, but here too the area sown to wheat has been reduced to a minimum owing to the long winter, which lasted into March.

Other spring sowings, especially peas, barley and oats, have also been delayed this season.

External trade.

Development — In spite of international events, Romanian foreign trade was satisfactory. Total imports in 1939 amounted to 22,890 million lei, the value of exports being 26,809 million, with a consequent favourable balance of 3,919 million lei. Most of this favourable balance is due to trade during the last six months of the year. The foreign trade position was better than in 1938, as will be seen from the following table ⁽¹⁾

	Imports		Exports		Balance	
	Quantities (metric tons)	Values (million lei)	Quantities (metric tons)	Values (million lei)	Values (million lei)	
1939	739,039	22,890,474	7,564,146	26,809,349	+	3,918,875
1938	820,602	18,767,830	7,409,084	21,532,580	+	2,764,750
Difference	81,563	+ 4,122,644	+ 155,062	+ 5,276,769	+	1,154,125

The chief products forming the basis of exports are petroleum products, timber, cereals and live animals. Considerable fluctuations have taken place during the past three years, 1937, 1938 and 1939. While large quantities were exported in 1937, both quantities and values declined in 1938, a considerable increase was, however, registered in 1939, not only in quantities but also in the prices received for all the principal products. This is shown in the following table.

Exports	1937		1938		1939	
	Quantity (metric tons)	Value (million lei)	Quantity (metric tons)	Value (million lei)	Quantity (metric tons)	Value (million lei)
Petroleum products	5,308,944	23,452,396	4,406,520	9,313,224	4,178,100	11,226,564
Timber	1,176,036	2,828,592	967,188	2,465,376	859,632	2,529,876
Cereals	2,225,640	10,177,764	1,384,812	5,257,860	1,973,832	7,209,804
Live animals	65,400	1,339,359	58,992	1,220,868	77,472	1,800,156

Studies of foreign trade over the last six months concerning products included in the cereal and livestock groups point to a steady upward trend. The largest quantities were exported in November and December 1939, as will be seen from the following table, which shows exports of agricultural products during the last half of 1939:

Regulation of foreign trade. — To meet the expenses of home defence and internal economic organization, on September 16, 1939 the government issued a decree-law

⁽¹⁾ *Information Bulletin* issued by the National Bank of Romania.

	July			August			September			October			November			December		
	Quantity (metric tons)	Value (million lei)	Quantity (metric tons)	Value (million lei)	Quantity (metric tons)	Value (million lei)	Quantity (metric tons)	Value (million lei)	Quantity (metric tons)	Value (million lei)	Quantity (metric tons)	Value (million lei)	Quantity (metric tons)	Value (million lei)	Quantity (metric tons)	Value (million lei)	Quantity (metric tons)	Value (million lei)
<i>Cereals</i>																		
Total	177,254	688,119	105,068	454,615	103,830	411,142	123,684	500,611	212,219	945,101	201,640	793,092						
Wheat	117,815	452,309	40,904	187,704	46,156	178,628	71,682	266,368	159,376	590,017	125,029	448,387						
Rye	4,103	10,614	2,771	7,987	7,095	20,263	10,395	28,088	3,928	12,875	4,858	13,951						
Barley	21,852	80,478	42,765	143,130	31,949	98,970	25,770	80,728	12,773	46,232	4,848	17,417						
Maize	31,889	134,135	9,737	44,930	7,106	28,196	4,125	16,582	17,433	64,938	61,500	250,509						
Miscellaneous	1,595	10,583	9,791	70,864	11,524	85,085	11,711	108,845	18,709	231,039	5,399	62,798						
<i>Live animals</i>																		
Total	3,849	79,669	4,907	100,244	5,118	105,463	10,836	275,186	11,968	321,665	4,461	136,290						
Cattle	721	8,468	1,121	12,338	2,547	46,135	6,796	160,482	7,257	151,700	1,127	10,385						
Pigs	2,497	61,865	3,346	81,833	2,191	54,118	3,788	111,373	4,507	166,723	3,171	113,216						
Miscellaneous	631	9,336	440	6,073	380	5,210	252	3,331	204	3,242	163	3,689						

concerning the regulation of foreign exchange, providing that import requirements and various payments due in foreign countries should be satisfied in the following proportions to the value of the total volume of exports:

(1) A quota of 45 per cent. for the payment of armaments, government supplies, service of the public debt, expenses of diplomatic offices abroad and all other government payments.

(2) A quota of 30 per cent. for the payment of raw materials.

(3) A quota of 25 per cent. for the payment of all products necessary for the expansion of production, home consumption, private financial transactions, study, touring, public health work and all other payments.

The Foreign Exchange Office, which has entire charge of foreign trade, was established by decree-law on September 30, 1939.

As a consequence of the application of this decree-law, from October 1, 1939 no merchandise could be exported without an export permit granted by the Foreign Exchange Office.

The Foreign Exchange Office is empowered to take any measures considered necessary for the application of the foreign trade regulations.

The Ministry of Foreign Trade was created by decree-law of February 16, 1940, for the purpose of organizing, directing and encouraging economic relations with foreign countries. The new Ministry has the following powers:—

(a) to negotiate treaties, conventions, trade and clearing agreements with foreign countries;

(b) to take legal measures for their application;

(c) to supervise with all due care the execution of such treaties, conventions and agreements through its offices;

(d) to take all measures for the encouragement and increase of exports, to control the quality of goods exported in order to maintain their reputation abroad, to arrange for the representation of Romania at fairs and exhibitions of an economic nature and to organize the control exercised by the associations of exporters;

(e) to adopt all the measures necessary for regulating imports, exports and foreign payments, to fix the quotas and sums available, and to issue permits for the export of products and the transfer of money.

To handle these various matters, the Ministry of Foreign Trade has been divided into departments, each with clearly defined powers on the basis of the classification described above.

Treaties and trade agreements. — A payments agreement was concluded between Romania and Hungary in September 1939.

In November of the same year, a *modus vivendi* concerning trade exchanges and the regulation of payments was added to the terms of the agreement between Romania and Switzerland then in force.

During the same month a payments agreement was concluded between Romania and Turkey.

In December 1939, a payments agreement was concluded between the Royal Romanian Government and the Government of the Slovak Republic.

In February, 1940, the Romanian and Bulgarian Governments concluded a payments agreement.

A similar agreement between Romania and Italy was signed at Bucarest in March.

Measures relating to the marketing of agricultural products.

Wheat. — To stimulate wheat cultivation and to prevent a decline in the area sown to this crop, the government took steps to guarantee a satisfactory price. A Wheat Valorization Law was therefore passed, the price for the 1939 crop being fixed at 42,000 lei per waggon load of 10 metric tons, on condition that the weight per hectolitre be 75 kilogrammes and that the content of foreign bodies do not exceed 3 per cent. This price is paid free-at-station at the place of production.

The price of 42,000 lei per waggon-load of 10 metric tons will be raised by 1,000 lei for September, by 2,000 lei for October and November and by 3,000 lei for December, while in January the original price will be paid.

The price of wheat weighing more or less than 75 kilogrammes per hectolitre and containing more or less than 3 per cent. of foreign bodies will be raised or lowered by 1 per cent, in relation to the basic price, for each kilogramme more or less and for each percentage of foreign bodies above or below the established 3 per cent.

The National Bank of Romania is authorized to finance the National Institute of Co-operation which has been appointed to purchase wheat up to a value of 2,000 million lei.

To guarantee a remunerative price and to stimulate exports of wheat, exporters will be allowed a percentage of free exchange. The amount of this quota is fixed periodically and published in the *Official Journal*.

Over and above this quota, exporters are granted a bonus when the foreign exchange is paid into the National Bank of Romania. The amount of this bonus also is published periodically in the *Official Journal*.

Tobacco. — Tobacco cultivation is a monopoly and the cost price is fixed yearly by the Independent Monopoly Firm (C. A. M.). Prices are fixed on a basis of quality and variety, and were as follows for 1939

Tobacco of inferior quality	from 12 to 24 lei per kilogramme
Tobacco of medium quality	» 21 to 45 » »
Tobacco of superior quality	» 40 to 140 » »

Over and above these prices, the Independent Monopoly Firm pays cultivators a bonus of 1,000 lei per hectare when the crop has been grown under satisfactory conditions.

Sugar beet. — The price of sugar beet grown during 1940 and delivered to the sugar factories during the 1940-41 season is fixed at 10,400 lei per waggon-load of 10 metric tons, free-at-station at the source or on the factory scales. The price was established by decision of the Ministry of National Economy

Other products. — All other agricultural products are uncontrolled.

Measures relating to agricultural production.

GENERAL MEASURES FOR THE ENCOURAGEMENT OF AGRICULTURAL PRODUCTION

As a result of the international situation, which seriously affected conditions within the country, the Romanian Government took very effective measures during the autumn of 1939 for the organization of agriculture under the exceptional circumstances in order to guarantee an agricultural output which would suffice for the requirements of the army and the civil population.

In carrying out its programme the Ministry of Agriculture and Crown Lands must prepare a general plan each year for the organization of agriculture. This plan must comprise:

- (a) The preparation of a crop plan.
- (b) The provision of the necessary seeds and animals for breeding purposes.
- (c) Arrangements providing that all draught animals, vehicles, tractors, machinery and implements used in agriculture as well as breeding animals shall be exempt from requisition measures.
- (d) Mobilization of the staff required by government institutions and private farms.
- (e) Requisitioning of labour for farms and of pensioners for public institutions.

A law to this effect came into force during the autumn of 1939, with the result that, in spite of unfavourable weather conditions, 3 million hectares were sown to wheat and 80,000 hectares to barley.

In November 1939, the Ministry of Agriculture and Crown Lands organized a wheat and maize competition, in which farmers throughout the country and from every type of farm (large-scale, medium-size and small) took part. In spite of the difficult terms imposed, 10,069 farmers took part in the wheat contest and 12,211 in the maize contest. Money prizes, medals and diplomas to a total value of 5.5 million lei were awarded to farmers who distinguished themselves in the competition. The results obtained led to the conclusion that the crop harvested, especially by small farmers, was much better both as regards quality and as regards the yield obtained per hectare.

The Ministry of Agriculture and Crown Lands has prepared a " five-year agricultural plan " embracing the complete and final organization of Romanian agriculture. The plan includes the following points: stabilization of property rights, adoption of rational methods in connection with agricultural production properly so called, improvement of peasant diet, arboriculture, viticulture, animal husbandry, technical undertakings of general interest, labour, valorization of agricultural products, organization of agriculture and forestry.

The plan for the stabilization of property contemplates the necessary measures for preventing the breaking-up of estates.

In rationalizing methods of cultivation, an attempt is being made to reduce the area sown to wheat by 800,000 hectares and that sown to maize by 500,000 hectares in regions unsuited to these crops. The total output must, however, be maintained at the same level and even increased by improving the yield per hectare. Simultaneously an attempt is being made to reduce the area of fallow land by 300,000 hectares, while the surplus area of 1,700,000 hectares must be used for the cultivation of oil-producing, textile and medicinal plants.

An extension of vegetable growing on all farms is aimed at, with a view to improving the diet of the peasants.

Arboriculture and viticulture occupy an important place in the five-year plan, both as regards actual cultivation and the profitableness of these crops.

In connection with stockbreeding an attempt is being made to increase the number of selected animals for breeding, to eliminate animal diseases, to make the most of live-stock and animal products and to encourage the industrialization of products, etc.

The plan includes a programme of technical undertakings, such as the building of dams in the areas suitable for flooding in the basins of the Danube, Dniester, Tisza and Pruth, etc.; irrigation in the arid areas, especially those in southern Bessarabia; the improvement of communications, etc.

The organization of agricultural labour aims at fixing a fair wage for workers and providing them with suitable diet and hygienic housing conditions.

A policy will be adopted such as will reduce the discrepancy between the prices of industrial and agricultural products.

The five-year plan provides for a minimum expenditure of 600 million lei annually for the introduction of a rational system of farming; this sum, totalling 3,000 million lei for the five-year period, will be paid out of the ordinary budget of the Ministry.

Land tenure system.

To exercise the right of pre-emption, to finance these operations and at the same time to prevent the breaking-up of farms, the Ministry of Agriculture and Crown Lands has concluded a 30-year agreement with the Bank of Industry and Valorization of Agricultural Credits (B. I. N. A. G.).

In application of this agreement the above bank is to create an agricultural section to handle all the operations required under the agreement. All property purchased and not used for settlement will be sold as it stands.

If the property cannot be sold as a whole within two years, the B. I. N. A. G. can break it up and sell it in lots of not less than 15 hectares.

Estates purchased by the B. I. N. A. G. may only be sold to Romanian subjects who will themselves undertake to exploit the land as farms.

Purchasers of land will pay 20 per cent. of the total value of the property at the time of purchase, the remainder of the cost to be paid off within 20 years in annual instalments payable on November 15 each year, plus 5 per cent. interest.

Properties purchased by the B. I. N. A. G. cannot be broken up and must be transferred in their entirety to Romanian subjects only. A clause stating that the property is not to be broken up must be included in the deed of purchase and sale.

Estates purchased in conformity with the existing law may be inherited only as a whole by a single heir designated by the father in some written form; if no such designation exists, the property passes to the youngest of the children. When there are no children, right of inheritance is awarded to the heir offering the best guarantees.

Other heirs will be compensated for the loss of their rights, in ten equal instalments.

To provide funds for the purchase of property where there is right of pre-emption, the National Bank of Romania has been authorized to open a rediscount credit in the name of the B. I. N. A. G. for a minimum of 300 million lei, at a preferential discount rate of 2 per cent.; this credit is guaranteed by the State.

Work of public and private agricultural organizations.

During the year 1939-40, the Romanian Government has made great sacrifices for agriculture as a whole both as regards the valorization of output and the provision of various industrial products.

The following is a list of funds made available for agricultural purposes:

(1) For agricultural production: 1,000 million lei at a preferential interest of 2 per cent.

(2) For the valorization of the previous year's crop: 4,000 million lei.

(3) For purchases of agricultural produce made by the Ministry of National Defence: 700 million lei.

(4) For supplying farmers with cotton yarn: 500 million lei.

(5) For encouraging co-operative trading societies: 100 million lei; 50 million of this amount was used for the valorization of the wine crop and of exports made by the National Federation of Wine Co-operative Societies.

(6) The Bank placed 774 million lei at the disposal of farmers for the valorization and industrialization of agricultural products. To this sum were added a further 130 million lei for the valorization of the wool crop and 300 million for the exercise of the right of pre-emption.

(7) Lastly, 240 million lei were distributed through the Industrial Credit Institution and commercial banks, for the valorization of wool, while 721 million were made available by the Service of Ports and Water Communications for the construction of silos.

The Ministry of Agriculture and Crown Lands is now carrying out a programme of intensive propaganda in connection with this year's spring field work in order that sowings and cultivation may go forward under favourable conditions.

Arrangements have also been made to allow the army and the youth and pre-military organizations to help farmers lacking machinery and draught animals. Measures have also been taken in connection with seed supplies, 500 wagon-loads of spring wheat, barley, oats, potatoes, sunflowers, hemp, flax, linseed and cotton having been purchased for this purpose.

The seed is to be distributed among the farmers at a 20 per cent. reduction. Twenty-eight waggon-loads of fodder seeds have also been purchased.

Besides the above supplies, similar operations have also been effected by the departmental co-operative federations with funds obtained from the National Bank in the form of a repayable credit of 300 million lei.

Vegetable seeds for a total of 12 million lei were purchased this spring for the establishment of 4,300 vegetable nursery gardens. Farmers will pay only 10 per cent. of the value of seeds and nursery plants distributed.

The government has also started a campaign to supply all farms with an inventory. Numbers of tractors, threshing and sowing machines have been purchased recently, considerable reductions having been made in the import duties on these items.

GH. ST. CIULEI.

BIBLIOGRAPHY ON ECONOMIC AND SOCIOLOGICAL SUBJECTS

LORENZONI GIOVANNI (Professor of Florence University): *Relazione finale dell'inchiesta sulla piccola proprietà coltivatrice formatasi nel dopoguerra*. Istituto Nazionale di Economia Agraria, Roma, 1938.

In 1928 the National Institute of Rural Economy on the suggestion of its president, Professor Arrigo Serpieri, decided to carry out an enquiry into the small peasant properties formed in Italy after the Great War. The enquiry was entrusted to a group of technical delegates under the direction of Professor Giovanni Lorenzoni, who was also to describe the full results obtained. As a result of these activities fourteen volumes have been published covering the various regions of Italy.

As the author remarks, the results which stand out from these researches are very striking. For during a period of 15 years about 1,000,000 hectares of cultivable land, or 6 per cent. of the cultivable area of Italy, have been transferred to peasants directly working their own lands. The peasants who benefited number about 500,000 and may mostly be classed under the three heads of small proprietors, tenant farmers

and métayers or other share-farmers. The average area purchased by each peasant amounts to 2 hectares and, as about three-quarters of the purchasers were already small proprietors, 750,000 out of the 1,000,000 hectares transferred have gone to enlarge already existing small properties, which in this way have become independent properties from the economic viewpoint. The remaining 250,000 hectares have been employed in the creation of new properties, mostly of very small area.

The lands have almost all been purchased by way of free negotiations at an average price of 4,500 lire per hectare, involving a total expenditure of some 4.5 milliard lire. This sum has been covered almost entirely by the peasants out of their own savings.

This new formation of small properties has been most evident in North Italy, the greatest increases in the area under small holdings being found in Venetia and in Lombardy, where they amounted to 11.3 and 11.0 per cent. respectively of the cultivable area. However, in Sicily also the increase has been striking, amounting to 7.8 per cent. of the cultivable area.

As a consequence of the phenomenon studied in the enquiry, the 1931 census showed that wage labourers not directly interested in the running of the farm on which they work accounted for only 34.8 per cent. of the total as against 65.2 per cent. who had a direct interest of the type described. These figures represent almost a complete reversal of the situation revealed by the 1921 census, when the two percentages amounted to 46.5 and 53.5 respectively.

The author dwells on the general aspects of the phenomenon, which he analyses in its causes and in its development as also in its economic and social consequences, and the effects on it of the economic crisis. He then goes on to suggest three means which he considers especially suited to improve and consolidate the position of the small peasant proprietors, namely the development of co-operation, the consolidation of small scattered holdings and the reform of the inheritance laws. On this latter point the author suggests that in cases of succession *ab intestato* the property should pass to the eldest son or to another son named by him and possessing the qualities required for a good peasant, subject to the obligation to compensate the co-heirs on the basis of an estimate not of the selling value of the property, but of its income-yielding value.

G. C.

ENQUÊTE SUR L'HABITATION RURALE EN FRANCE. Tome I: Considérations générales. Tome II: Rapports départementaux. Paris, Henri Danaud, 1939, 250. fr.

This enquiry was carried out by the *Commission d'Etudes de l'Habitation rurale* set up in France by the Ministry of Public Health in agreement with the Ministry of Agriculture, and in conformity with a decision taken by the Hygiene Section of the League of Nations following the European Conference of Rural Hygiene, held at Geneva in 1931.

The view taken is that rural housing must be considered strictly within the framework of rural life, in which farming plays the dominant rôle. In estimating therefore, the state of rural housing and when essential improvements are being introduced it is deemed necessary to put oneself in the position of the farmer, and so to have in view his resources and means of production, the conditions governing his own life and that of his family, the agricultural organizations surrounding him, and the system of rural health.

As a result of investigations, it appears that in the period covered (1919-1929) 255,377 new buildings were erected, being distributed as follows: complete farms, 21,056; farmers' dwellings, 48,632; workers' dwellings, 10,921; stalls and stables, 60,006; barns, 38,278; store-houses, 76,484.

Thus the greatest expansion occurred in farm buildings, particularly in the case of average-sized and small farms.

From the material obtained from this enquiry emerges the fact of the effort of the rural population to increase the comfort of their dwellings. Better general education, increased contact between the urban and rural sections of the community arising from better transport facilities, health propaganda, improvement in agricultural technical and economic knowledge have all contributed to this bettering of rural housing. This was, however, also speeded up by the need for keeping the members of families on the land—the fight, in fact, against the rural exodus.

G. C.

INDIA, DEPARTMENT OF COMMERCIAL INTELLIGENCE AND STATISTICS: *Crop Atlas of India (Revised edition)*. Manager of Publications, Delhi, 1939, 13/—

The new edition of this very useful publication contains heliozincographed cartograms, on the scale of roughly 1: 10,000,000 showing by different shades of red the percentages of net sown area under each of eighteen crops. Maize, gram (chick-pea) and castor have been added to the crops represented in the last edition and indigo, no longer of any considerable importance, has been omitted. The last edition appeared in 1923 and was based on statistics for the five years ending 1918-19. The data in the new edition refer to the three years ending 1932-33; Burma is still included and Bihar and Orissa are shown as a single province. Areas of no returns in the previous edition, that are now filled in, are Hyderabad, the Shan States, Putao, Karenni and parts of the North West Frontier Province. The number of percentage groups has generally been increased by subdividing the former 5-20 per cent. and 20-40 per cent. each into two groups. For wheat the percentage groups have been increased by four. A welcome addition is a map of cotton varieties based on the revised trade classification of 1939; this map shows the new provincial boundaries and excludes Burma.

The cartograms are of particular use for statisticians and others wishing to see at a glance the relative importance of a particular crop in each district. Inset diagrams show the relative importance of the various provinces as producers of each crop. Cartograms of the proportions of sown area to total area and of livestock densities would be a desirable addition.

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MONTHLY BULLETIN

OF

AGRICULTURAL ECONOMICS AND SOCIOLOGY

AGRICULTURAL CREDIT: ITS ORGANIZATION AND NEW TENDENCIES: GERMANY ⁽¹⁾

The present article is a sequel to the general survey on the organization of agricultural credit and the new tendencies observed in this field after the Great War, and is the first of a series of articles describing in outline the different systems of agricultural credit with their characteristic features in various countries.

In the present article on Germany a description is first given of the present trends of agricultural credit policy stressing the importance of the central agricultural credit institutions and especially of the Deutsche Rentenbank-Kreditanstalt; after which the various types and forms of this credit and the usual loan conditions are considered.

I. — The New Agricultural Credit Policy.

In the general survey of the organization of agricultural credit published in this Bulletin (November and December, 1939) it was remarked that this organization varies in form from one country to another according to the importance of agriculture and to the physical, economic and social conditions. Whereas in some countries this organization has reached a high degree of perfection, in others it has made but little progress. Germany belongs to the former group, with an agrarian credit system capable of handling all the needs of agriculture and characterized by the existence of numerous credit institutes either regulated by law or controlled by the State, by a mortgage system based on clear and well-defined rules and all the main types of credit institutes have central organizations with provincial, state or national spheres of activity; these are central institutes appointed to control the distribution of capital and to maintain the

⁽¹⁾ The following is a list of some of the principal works of a general character consulted:— *Probleme des Agrarkredits*; a series of German lectures given at the first International Agrarian Congress held at Naples during October 18-23, 1938. Published by the German group of the International Agricultural Credit Conference in the "Deutsches Institut für Bankwissenschaft und Bankwesen", 1939. — *Gefüge und Ordnung der Deutschen Landwirtschaft*: a collective work of the research service edited and published by KONRAD MAYER, Reichsnährstand Verlagsgesellschaft, Berlin, 1937. See Part 2 (Die Ordnung der deutschen Landwirtschaft), section G (Die Ordnung der landwirtschaftlichen Erzeugung), No. 4 (Kredit- und Steuerordnung in der Landwirtschaft). — *Die Kreditlage der deutschen Landwirtschaft*. Published by the "Deutsche Rentenbank-Kreditanstalt". Period from 1933-34 to 1937-38. — *Verwaltungs- und Geschäftsberichte der Deutschen Rentenbank-Kreditanstalt (Landwirtschaftliche Zentralbank)*. Period from 1933-34 to 1937-38.

balance and efficiency of the credit machinery as a whole. As a rule, the State makes use of these bodies for the execution of its agrarian credit policy, the *Deutsche Rentenbank-Kreditanstalt*, which is the most important central institute for agrarian credit in Germany, being the one most often employed for this purpose.

The reason why the credit system was able to hold out against the difficulties arising firstly from inflation and later from the agricultural crisis, without undergoing any radical changes in its traditional framework (with the exception of the foundation in 1925 of the *Rentenbank-Kreditanstalt*), is to be found in the existence of a great number of institutions offering varying forms of credit, in the diversity of their characteristics determined by the region in which they operate and its prevailing economic conditions, and in the reciprocal financial support guaranteed through the central institutes acting as clearing houses. However, although the structure of the agrarian credit system has remained substantially unaltered since the Great War, important changes have taken place in the practice of granting credit in accordance with the aims of the new agricultural policy adopted by the government of the Reich. These aims are essentially two, each intimately bound up with the other, namely the guaranteeing of the nation's independence as regards foodstuffs and the preservation and consolidation of the peasant class (*Bauern*) ⁽¹⁾. In order to attain the former end, the "production campaign" was launched six years ago. The campaign is based on the control of markets and prices, through the law on the Food Corporation (*Reichsnährstandsgesetz*) promulgated on September 13, 1933. Special groups created in each sector of the food economy exercise this control in order to balance supply and demand by means of controlled and basic prices and to ensure that the producer obtains fair prices which are at the same time within the means of the consumer.

As a result of the numerous measures for intensifying crop cultivation included in the "production campaign" programme an increased demand for credit has resulted in order to make possible the more extensive use of chemical fertilisers, machinery and implements. This is demonstrated by the fact that annual farm expenses have increased from RM. 5,850 million in 1935-36 to RM. 6,400 million in 1936-37 and to RM. 6,900 million in 1937-38. An idea of the effort required to accelerate the rate of increase in output may be gained from looking at the figures concerning food requirements for home consumption which increased as follows between 1932 and 1937: wheat flour, 25 per cent.; sugar, 24 per cent.; fruit, 34 per cent.; butter, 23 per cent.; meat, 11 per cent.; milk, 12 per cent.

The improvement in the position of agriculture resulting from the organization of the agricultural market and the adoption of a system for fixing prices removed what had long been one of the chief causes of farm indebtedness, namely the need to cover farm losses by means of credits. The opening of credits to

⁽¹⁾ Throughout this article the word "peasant" is always used with the meaning of the German term *Bauer*, that is, the owner of an *Erbhof* or hereditary peasant holding of the type described on pages 215-216.

cover farm losses is now confined to exceptional cases such as damage due to unfavourable weather conditions, poor crops or animal diseases. On the other hand, a new reason for having recourse to credit is found in the fact that the farm is becoming increasingly involved in the market mechanism through the sale of its products; in fact, only about one quarter of the farm output is consumed on the farm itself, the remainder being disposed of on the market. This has led to a demand for credit for the harvesting, storage, preservation and marketing of products.

In connection with the "production campaign" it also became necessary to carry out important land improvement schemes ⁽¹⁾ such as the regulation of water courses, the cultivation of waste land and the winning of new land from sea and swamps. In the six-year period 1933-1938, some RM. 1,169 million were spent on such works and about 2 million hectares of land improved. Out of the above mentioned total costs RM. 316 million were covered by provincial, State and Reich subsidies and RM. 253 million were contributed by the Reich Office for Employment and for Unemployment Insurance, the remaining RM. 600 million being covered by the beneficiaries themselves or through loans. As in other cases, the central body for the necessary credits is the *Rentenbank-Kreditanstalt*, which used its own resources and those of third parties for the purpose. The outstanding credits for land improvement granted by this institute amounted at the end of 1938 to some RM. 600 million.

Agricultural settlement also shared in stimulating agricultural production during the past few years and in leading to the creation of a large number of peasant farms. In the twenty-year period 1919-1938, 77,865 new farms were created with a total area of 930,725 hectares ⁽¹⁾. In addition to the creation of new farms, 7,818 small farms were also increased in size in 1938. This indeed constitutes the second part of the settlement policy, but also involves a heavy investment of capital, part of which is obtained by credit.

The second important aim of the new German agricultural policy which seriously affects the operation of land credit, is that contemplated in the law on hereditary peasant holdings (*Reichserbhofgesetz*) of September 29, 1933. This law is founded on the recognition of the peasant class as the backbone of the nation and it has therefore endowed the hereditary peasant farm with a special juridical status. Since the *Erbhof* must constitute a self-supporting farm, minimum and maximum limits are laid down for its size of 7.5 and 125 hectares respectively, which limit can only be exceeded in very exceptional cases. The peasant farms contemplated in the law are protected from excessive debt and from the breaking up of the property among the owner's heirs; in accordance with the old tradition prevailing in 4/5 of German territory these lands pass in their entirety to a single heir.

Besides this restriction of succession the farm is also protected in its entirety from land speculation; whilst it cannot be mortgaged except in certain

⁽¹⁾ See the chronicle on Germany in the *Monthly Bulletin of Agricultural Economics and Sociology*, February, 1940. International Institute of Agriculture, Rome.

exceptional cases approved by the special courts created by the law (*Anerbengerichte*). Creditors cannot therefore compel the sale by auction of either the farm itself or of anything forming part of it, and even as regards the farm produce itself such sale is allowed only in so far as it does not endanger the running of the farm or the maintenance of the family. On the other hand, however, there are also severe measures to compel debtors to meet their obligations.

The fact that of 1,602,000 medium sized farms in the former territory of the Reich no fewer than 700,000, covering 40 per cent. of the cultivated area, are represented by *Erbhöfe* shows how much the operation of land credit is affected by the special juridical system introduced in the law of September 29, 1933. There is therefore much less scope than formerly for incurring debt as the result of change of ownership and inheritance adjustments. According to the spirit of the law, the *Erbhof* should be assisted chiefly by short- and medium-term credits, with the latter possibly in the form of personal credit.

Even in the case of farms which do not come under the heading of *Erbhöfe*, the credit necessary for acquiring possession of the land is much smaller than formerly, as the result of the new ideas concerning value now predominating in German agriculture according to which the land is no longer considered as merchandise to be bartered, but as the farmer's basis of work and maintenance. This is also shown by the fact that the amounts paid by the heir to a farm for the board and lodging of his parents (*Allenteile*) are included under a separate head in the debt incurred for inheritance adjustments; it is estimated that this item has fallen from RM. 1,600 million in 1933 to RM. 1,000 million in 1939 ⁽¹⁾.

Certain essential conditions had to be established in order to ensure the success of the "production campaign"; the first of these was to lighten the indebtedness of farms due to the Great War and the fall in prices of agricultural products. This led to the adoption of a far-reaching policy of debt reduction characterized by numerous emergency measures ⁽²⁾. In consequence of the adoption of these measures, farms were no longer judged by the usual economic standards; compulsory auction sales of farms and seizure of property were forbidden, and instead a gradual recovery of agriculture was brought about by the reduction of indebtedness and interest rates. This recovery, however, made heavy demands on public funds, partly for making adjustments between debtors and creditors, and partly to provide contributions to the payment of interest and the making of new investments. This led to a change in the sources of funds for land credit, State funds becoming an important source of agrarian credit ⁽³⁾ in addition to private funds.

⁽¹⁾ KISSLER, Hermann: Die Grundlagen des Agrarkreditsystems in Deutschland. In *Probleme des Agrarkredits* already quoted.

⁽²⁾ See *Agricultural Indebtedness*. International Institute of Agriculture, Rome, 1937.

⁽³⁾ Measures for the reduction of indebtedness were most far-reaching in the territory contemplated by the *Osthilfe*, which originally consisted of East Prussia alone. The area was however gradually extended, as the result of various regulations concerning indebtedness, to include all the territory

As a result of the economic and financial experiments made by Germany during and since the Great War as also of the above-mentioned new principles inspiring the new agrarian policy, agricultural credit policy is tending towards a definite reduction of the so-called "unproductive credits", consisting for the most part of credit granted on transfer of property rights or in the course of agreements arising out of inheritance, but towards an extension of productive credit granted to farmers through organizations for the purchase and sale of products.

II. — Central Agricultural Credit Institutions.

These institutions are of paramount importance in the organization of German agricultural credit and may be divided into two large groups, as follows:

(1) Central credit institutes, so called because they are at the head of an organized substructure embracing the whole territory of the Reich. The substructure of the *Deutsche Zentralgenossenschaftskasse (Deutschlandkasse)* is represented by the rural banks, that of the *Zentrallandschaft* by the *Landschaften* and that of the *Deutsche Girozentrale-Deutsche Kommunalbank* by the savings banks.

(2) Credit institutes which, although not at the head of an organized substructure, nevertheless fulfil one or more special functions of general economic and financial interest. The chief of these are: the *Deutsche Rentenbank-Kreditanstalt*, the *Deutsche Siedlungsbank*, the *Deutsche Bodenkultur A. G.*, the *Zentrale für Bodenkulturrkredit* and the *Preussische Landesrentenbank*.

Further mention will be made of each of these institutes in connection with the individual forms of agricultural credit. A detailed description of the *Deutsche Rentenbank-Kreditanstalt* will be given here, however, in view of its particular importance.

THE DEUTSCHE RENTENBANK-KREDITANSTALT (RKA).

The *Rentenbank-Kreditanstalt*, which has a juridical status defined by public law and was founded in 1925, is the central bank for German agriculture, as may be seen from its sub-title (*Landwirtschaftliche Zentralbank*). Its functions are central in so far as it does not grant direct credit to agriculture, but acts

east of the Elbe and the East Bavarian Marches. Measures for the reduction of indebtedness were later extended to the whole of the Reich under the law of June 1, 1933. The *Bank für Deutsche Industrie-Obligationen* was appointed as the central body for the carrying-out of the recovery policy among indebted farms under the *Osthilfe* law of March 31, 1931, and spent RM. 561.7 million for this purpose (March 31, 1938). This institution succeeded in reducing the indebtedness of the *Osthilfegebiet* (Mecklenburg, Pomerania, East Prussia, Lower Silesia, Upper Silesia and Brandenburg) from some RM. 1,700 million to RM. 1,400 million and 41,435 farms were cleared of debt (March 31, 1938). For further information see *Entschuldung der Ostdeutschen Landwirtschaft*, edited by LEO DRESCHER. *Bank für Deutsche Industrie-Obligationen*. Berlin, 1938.

through the medium of certain agricultural credit institutes⁽¹⁾. It differs from the other central institutes in that it is a universal bank, as its activities include all branches of agricultural credit and are not confined to any special task, as is the case with the other central institutes which are severally detailed to stimulate personal co-operative credit, credit for improvements, the financing of settlement, etc.

The central position and the universal character of the RKA, the importance of which is enhanced by the fact that its capital amounts to RM. 500 million, while its assets total nearly RM. 2,000 million, bring its activity into close relationship with the general economic and agricultural conditions in the country. This although, on the one hand, it limits the scope of the activities of the institute, on the other gives it well-defined duties and opportunities in the sphere of agricultural credit policy⁽²⁾.

The Bank does not attempt to make profit, but does business exclusively for the purpose entrusted to it by law, namely, to grant credit on the most favourable conditions obtainable in order to stimulate agricultural production and agriculture as a whole. It has therefore always adjusted its interest rates in such a way as to render them independent of the free money market. The Bank has also introduced the nine-months' bill of exchange and has encouraged the use of medium-term investment credits. It stimulates the trade in farm produce and the processing of such produce by financing sales, and has also been very active in backing the installation of dairies and creameries, co-operative distilleries, hemp retting ponds and in stimulating sheep breeding. Up to the end of 1937 credits granted to dairies totalled about RM. 12,453,000, those to distilleries RM. 955,500 and to hemp retting ponds RM. 1,200,000. The consortial credit (*Konsortial-Kredit*) granted to the *Reichsverband der deutschen Schafzüchter* for the encouragement of sheep breeding was raised to RM. 14,000,000.

Another field of activity which has been steadily extended, especially during the past few years, is the financing of land improvements. Realizing the value of land improvement from the standpoint of the national economy as a whole, as well as from that of agriculture, the *Rentenbank-Kreditanstalt* has given special attention to supplying credit for this purpose. The importance of a policy of internal settlement as a means of strengthening the position of the peasant class was also recognized from the outset by the Bank.

When the unemployment situation compelled the government of the moment to take special measures and the prevailing policy was that of helping the labour market through State intervention, the *Rentenbank-Kreditanstalt* granted credits for the execution of several schemes to provide work for the unemployed.

A study of the annual reports shows that the *Rentenbank-Kreditanstalt* engaged in many other undertakings and gave credit in numerous other forms, in-

(1) See *Die Bestimmungen über die Deutsche Rentenbank-Kreditanstalt nach dem Stande vom 1. September 1937*. Berlin, Reichsdruckerei, 1937.

(2) See HERMANN KISLER: *Zehn Jahre Deutsche Rentenbank-Kreditanstalt*. *Berliner Borsen-Courier*, No. 361. Berlin, August 4, 1935.

cluding reafforestation, the building of roads and farm labourers' houses and, above all, promoted agricultural recovery through the reduction of farm indebtedness. Mention will be made of some of these activities in the following pages. It may, however, be stated here that this « bank of banks » has completely fulfilled its financial and social tasks and not only subsidises agriculture but acts too in an advisory capacity; it has also proved a powerful instrument in the " production campaign ".

The bank of issue, the *Reichsbank*, may also be considered in connection with the central agricultural credit institutes, partly because it acts as the institute for re-financing indirect agricultural credit used for facilitating the marketing of produce, and partly because, through its command over the money market, it necessarily exerts an influence on the interest rates of agricultural credit.

III. — Types and Forms of Agricultural Credit.

UNPRODUCTIVE CREDIT AND PRODUCTIVE CREDIT.

In Germany the term " unproductive credit " is used to cover all credit which does not really help towards the actual running of the agricultural undertaking, but is granted to finance the transfer of property and in the course of agreements arising out of inheritance. This type of credit is not popular in agriculture because it does not contribute towards the economic progress and improvement of the farm and, in fact, reduces the funds required for interest payments and mortgage instalments.

This type of credit was, however, very general before the Great War. It is estimated that no less than 80 per cent. of the RM. 17,500 million agricultural indebtedness was due to agreements arising out of inheritance or to transfer of property. Mention has already been made of the reasons for the steady decline in the amount of unproductive credit and for the increasing importance of productive credit. This latter may be divided into the following groups: short- and medium-term personal credit, and long-term real credit.

Short-term personal credit is used mainly to cover ordinary running expenses. Long-term real credit is used for (1) building houses and farm premises; (2) purchasing heavy machinery and implements; (3) setting up accessory industries; (4) carrying out improvements on a large scale such as converting the farm to a more intensive productive system by improving or increasing the live stock; (5) affecting improvements in the narrow sense of the term, such as: (a) soil improvement, either by cultivating waste or unproductive land or by improving the area already cultivated by means of drainage, or irrigation operations, reafforestation, etc.; (b) consolidation of holdings, construction of watering-places for stock, aqueducts and farm roads.

Productive credit includes direct and indirect credit, the latter having become increasingly important in Germany since the Great War. As its name implies, it is granted not directly to the farmer but to organizations engaged in the sale and purchase of agricultural products and implements; its purpose is to cover

the cost of installation and operation. The new agricultural marketing system, which has transferred the function of accumulating stocks from the individual farms to the central market organization and in particular to the *Reichsstellen* created for each product, has also contributed towards the increase of indirect agricultural credit.

Indirect agricultural credit is granted in the first place by the central credit institutes and chiefly by the *Rentenbank-Kreditanstalt* and the *Deutsche Zentralgenossenschaftskasse*. The large banks and the specialized agricultural banks, including the *Getreidekreditbank*, the *Zuckerkreditbank* and the *Landmaschinenbank*, also undertake the financing of sales of agricultural products. However, the government, too, has contributed its share in the form of subsidies or reduction of interest on loans.

PERSONAL CREDIT.

Although organized agricultural credit has reached a high degree of development in Germany, non-organized personal credit, granted by shopkeepers, merchants, relatives and neighbours, still occupies a position of considerable importance. It is granted on terms and at interest rates which are as a rule unsuited to the needs of agriculture, so that it seems likely that this form of credit will gradually be replaced by organized personal credit.

Rural banks (ländliche Spar- und Darlehenskassen). — Organized personal credit is given chiefly through the rural banks, of which there were 20,573 on December 31, 1938.

Such banks may be either of the unlimited or the limited liability type; members of the former are responsible up to the total value of their property, while members of the latter are responsible only up to the amount guaranteed in the constitution agreement. In the past few years the unlimited liability co-operative banks have declined in number, yielding place to limited liability banks. In addition to the increase in short-term personal credit, medium- and long-term credits have also been increasing in importance.

The following table shows the relative importance of the various types of credits granted by the rural banks in recent years ⁽¹⁾.

Year (December 31)	Total credits	Loans and mortgages (Million marks)	Credits in current accounts and for merchandise
1933	1,964.0	676.6	1,287.4
1934	2,050.0	710.6	1,339.4
1935	2,063.0	816.6	1,246.4
1936	2,143.9	874.4	1,269.2
1937	2,209.1	942.1	1,267.0

⁽¹⁾ *Jahrbuch des Reichsverbandes der Deutschen Landwirtschaftlichen Genossenschaften-Ratfeisen* 9th year, 1938. Berlin, 1939.

The rural banks granted the *Erbhöfe* new medium- and long-term credits to a total of RM. 109.6 million during the period between the coming into force of the law on the *Erbhöfe* and 1937.

Loans generally take the form of the book credit, the types of securities preferred being the personal security and the pledge (*Lombard*). Bills of exchange are not much in request. Long-term credits are granted exclusively on mortgages.

The activities of the rural banks are not confined to banking operations in the strict sense of the term. A large number (3,638 in 1937) of the banks also engage in the selling of agricultural products and act as intermediaries for the purchase of commodities used in agriculture (14,078 in 1937). This commercial activity is often of vital importance to the economic interests of the members.

Satisfactory progress is observed among the rural banks in the formation of their own capital. In 1937 the unlimited liability banks showed an increase in capital of RM. 13.3 million as against an increase of 10.8 in the previous year, the total amounting to RM. 138.7 million. The limited liability banks showed an increase in their own capital of RM. 4.3 million in 1937, bringing the total to RM. 53.2 million, as against an increase of RM. 3.2 million in the preceding year.

Deposits increased considerably, as may be seen from the following table:

Year (December 31)	Total deposits	Savings deposits	Current account deposits
		(Million marks)	
1933	1,694.2	1,471.9	222.3
1934	1,860.3	1,612.1	248.2
1935	2,080.9	1,807.5	282.4
1936	2,335.8	2,020.9	314.9
1937	2,617.4	2,261.1	356.3
1938 (*)	2,990.4	2,574.4	416.0

(*) Provisional figures.

Rural banks in the former territory of the Reich have deposits amounting to almost RM. 3,000 million or 33.1 per cent. above the pre-War figure. The total increase since the end of 1932 amounted to RM. 1,300 million (73.5 per cent.).

As a rule there is a central bank in each federation district which acts as a clearing house for the local co-operative credit banks. There are 32 of these central banks.

As a result of the increased deposits, the indebtedness of the rural banks towards the central banks declined from RM. 203.7 million in 1937 to RM. 146.5 million in 1938. Credits, on the other hand, increased over the same period from RM. 544.1 million to RM. 714.4 million. Deposits have increased since

1933 by RM. 579 million (427.6 per cent.) and indebtedness has decreased by RM. 334.6 million (69.5 per cent.).

This evolution is reflected in the balance sheet of the *Deutsche Zentralgenossenschaftskasse*, which is the head co-operative institute. At the end of 1938 the indebtedness of the central banks to this institute amounted to RM. 104 million showing an increase of RM. 4.3 million as against the figure of December 31, 1937. Simultaneously credits increased to RM. 219 million, a rise of RM. 18.6 million.

Savings banks (Sparkassen). — These banks, which rank second in the field of organized personal credit, numbered 2,700 in 1937. Since in Germany these banks are founded and guaranteed by the communes and communal unions, they assume the character of public utility institutes offering a trustee standard of security.

Like the co-operative credit institutes, they grant loans mostly to small and medium-sized farms, and a survey made by the *Deutscher Sparkasse- und Giroverband* showed that, at the end of April 1934, of the total number of savings banks' credits outstanding 57.8 per cent. had been granted to farms with a cultivated area not exceeding 7.5 hectares, *i. e.*, generally speaking, less than the area necessary for the maintenance of the farmer and his family and therefore smaller than an *Erbhof*; 40.8 per cent. had been granted to farms with an area varying between 7.5 and 125 hectares, which latter figure represents the normal maximum area of the *Erbhof*, while only 1.4 per cent. had been granted to farms of over 125 hectares. The percentages corresponding to the amount of the credit were 41.9, 51.1 and 7.

The savings banks do not limit their interpretation of the term "personal credit" to the pure form of this type of credit, *i. e.*, to the so-called blank credits, consisting of loans against promissory notes without any special guarantee. On the contrary they also grant loans against special pledges (*Faustpfand*), personal securities or bills of exchange, as in the case of any of the personal credits granted to the *Erbhöfe*.

A feature which distinguishes the savings banks from the rural banks is that while the latter deal mostly in short-term personal credit, long-term mortgage credit is the prevalent form offered by the former.

At the end of 1935 the savings banks had granted in all 245,600 personal credits to agriculture worth RM. 333.9 million; 80,000 of these credits, representing about 45 per cent. of the total value, were granted to the *Erbhöfe*.

As in the case of the co-operative credit institutes, the savings banks have their regional clearing houses, the so-called *Girozentralen* which, in their turn, are controlled by the *Deutsche Girozentrale-Deutsche Kommunalbank*.

Other State-regulated credit institutions. — There are other credit institutions regulated by public law which deal in personal agricultural credit. These include the provincial banks, the provincial credit banks and the state banks, in the Ostmark the provincial mortgage banks and the banks affiliated to the

Landschaften. There are 13 provincial banks and their central institute is the *Deutsche Landesbankenzentrale A. G.* while the *Landschaften* banks have their central institute in the *Central-Landschafts-Bank*.

Private banks. — Finally there is a fourth group of institutes giving organized personal agricultural credit, namely, the private banks which are principally engaged in supplying the credit required by the large farms. Also belonging to the group of private banks are certain special agricultural credit institutes such as the *Getreide-Kreditbank A. G.*, referred to above, the *Bank für Landwirtschaft* and the *Deutsche Landvolk-Bank A. G.*

MORTGAGE CREDIT.

As in the sphere of personal agricultural credit, so in that of mortgage agricultural credit, non-organized credit has been of great importance. Private mortgage loans are given mostly in connection with credits for the acquisition of possession. At the end of 1913 the total amount of agricultural mortgage loans of private origin fluctuated between RM. 3,000 and RM. 5,000 million, as against some RM. 10,000 million granted by the credit institutes. According to data supplied by the *Institut für Konjunkturforschung*, the total amount of agricultural mortgages created by private individuals at the end of 1936 was about RM. 3,000 million, as against a grand total of mortgages amounting to some RM. 8,800 million.

State-regulated credit institutes. — State-regulated credit institutes are the most important in the organized mortgage credit. The first of these is the *Deutsche Rentenbank-Kreditanstalt*, which gives mortgage credit either out of its own funds or out of those of third parties obtained through the issue of loans. Other institutes included in the group of credit institutes regulated by law are the *Landschaften* (¹), which are the oldest special institutes giving mortgage agricultural credit in Germany, and their activity—unlike that of the other mortgage credit institutes—is confined exclusively to granting loans to agriculture against first mortgage. Although created originally to serve the large estates, these banks have gradually brought peasant holdings within their sphere of activity. As the credit offered by these banks cannot be withdrawn and is granted on easy terms, there has resulted a reduction in the number of the more onerous private individual mortgages so that the *Landschaften* therefore contributed in large measures to the improvement in the agricultural situation and made it possible to adapt farms to more rational methods of cultivation. The main feature of their activity is that they work exclusively in the

(¹) Regarding the origins of the *Landschaften* see M. TCHERKINSKY: *The Landschaften and their Mortgage Credit Operations in Germany* (1770-1920). International Institute of Agriculture, Rome, 1922.

interest of the farmer for purposes of public utility and for this reason are of extreme importance not only as mortgage banks but also as agricultural institutes.

The *Landschaften* are organized on co-operative lines so that the farms carrying a mortgage created by one of the *Landschaften* provide a collective guarantee, up to a definite amount, of the liabilities of these banks, which obtain the necessary funds for granting the credits by issuing mortgage bonds (*Plandbriefe*).

The central institute for these banks is the *Zentrallandschaft* which represents the combination of the so-called old *Landschaften* in an association operating in the public interest and for the express purpose of helping to provide capital by means of the collective issue and collective placing of its mortgage bonds. Larger numbers of these bonds are, however, issued by the individual *Landschaften*.

RM. 1,426 million, or over 60 per cent. of the RM. 2,300 million representing agricultural mortgages issued by all the State-regulated institutes granting real credit, is supplied by the *Landschaften* attached to the *Zentrallandschaft*.

This group of credit institutions regulated by public law also includes the provincial banks, the state banks and the provincial mortgage banks already referred to in connection with personal credit.

Savings banks. — The second place in the field of organized mortgage agricultural credit is held by the savings banks, which, as in the case of personal credit, deal principally with the small and medium-sized farms. At the end of March, 1938, deposits in these banks totalled RM. 16,500 million to which should be added RM. 2,700 million deposited with the clearing houses (*Girozentrale*). The standard by-laws authorize the savings banks to use 50 per cent. of their deposits for granting long-term loans, and at the end of 1937 they had some RM. 1,170 million placed in loans of this type. Increasing numbers of long-term loans have been granted by the savings banks during the past few years against redeemable mortgages, which represent 59.5 per cent. of the total number of loans granted and 63 per cent. of their value; fixed-term mortgages, on the other hand, represent 40.5 per cent. and 37 per cent. of the respective totals. About two-thirds of all agricultural mortgage credits granted by the savings banks have been given to small farms of which the area is less than the minimum area of an *Erbhof*, while loans granted to farms larger than an *Erbhof* represent less than 1 per cent. of the total number.

Joint-stock mortgage banks. — Private joint-stock mortgage banks rank third in this group ⁽¹⁾. They operate chiefly in favour of the larger *Erbhöfe* and the big farms of above 125 hectares in area. Of the total amount of loans granted

⁽¹⁾ *Die Deutschen Hypothekendarlehenbanken. Beiträge aus der Praxis. Deutscher Bodenkredit. Herausgeber Prof. Dr. Wilhelm Kalveram. Band III. Berlin, 1937.*

by these banks, only 11 per cent. went to agriculture. Like the institutes governed by public law these banks obtain their funds by issuing mortgage bonds. Since October 1, 1934, the joint-stock mortgage banks have been placed under the supervision of the Reich, exercised in every branch of their activity by the Ministry of Economy (*Reichswirtschaftsministerium*).

Rural banks. — Rural banks, which were discussed under a former head, are also of importance for the mortgage credit.

Insurance institutes. — Lastly, private life insurance companies had granted mortgage credits worth about RM. 2,568.6 million at the end of 1936; RM. 50 million of this amount was represented by land mortgages. On the same date social insurance institutes had granted land mortgage loans amounting to RM. 161.6 million, while state life insurance institutes had granted similar loans worth RM. 108 million.

SPECIAL FORMS OF AGRICULTURAL CREDIT.

Credit for improvements. — Mention was made in the first chapter of this article of the great progress made in Germany during the past few years in the field of land improvement. During the period from 1933 to 1938 ⁽¹⁾, 328 kilometres of torrents and 15,463 kilometres of rivers, affecting an area of 700,000 hectares, were rechannelled; 254,059 hectares were diked; 650,885 hectares were drained by means of open ditches and 341,911 hectares by drainage operations; on 29,904 hectares irrigation plants were set up; 103,129 hectares of waste land were brought under cultivation; 20,864 hectares were reclaimed along the coasts; 20,583 kilometres of rural roads were constructed and over 2,000,000 rural inhabitants were provided with drinking water.

In order to carry out this type of work a law was passed on February 10, 1937 creating hydraulic and land consortia (*Wasser- und Bodenverbände*). These are corporations with a standing under public law and which can obtain the funds required for their work from the *Deutsche Rentenbank-Kreditanstalt*, which, in its turn, finances the work through the issue of bonds for the cultivation of the soil (*Landeskulturrückstellungsbriefe*). However, as in the other branches of credit handled by this body, the granting of loans for land improvement is arranged through the State-regulated provincial credit institutes. This centralized method of financing the work makes it possible to arrange the distribution of the sums according to whether the regions requiring assistance have large or small amounts of capital at their disposal, so that in this way the maximum use may be obtained from the available resources. Improvement credits granted by the *Rentenbank-Kreditanstalt* totalled RM. 499,308 million by the end of 1937.

⁽¹⁾ See the February 1940 number of this *Bulletin*, p. 66.

Settlement credits. — No less important are the credits granted for settlement. Agricultural settlement has an old tradition in Germany and will be practised on an increasingly large scale as a result of the agricultural policy adopted by the Third Reich, which aims at increasing the number of peasant farms. With this purpose in view, on the one hand, the size of the small non-independent farms is being increased to the minimum areas of the *Erbhöfe* so that the farms may then be converted into *Erbhöfe*; on the other hand, the creation of new *Erbhöfe* is encouraged, the land being obtained mostly from the large estates. Hitherto uncultivated waste lands (swamps, moors) are of particular interest in connection with this new land settlement and much use is made of the German labour corps (*Reichsarbeitsdienst*) in the reclamation of such waste lands.

The installation of new settlers is facilitated by two forms of credit: intermediate settlement credit (*Siedlungszwischenkredit*) and long-term settlement credit (*Siedlungsdauerkredit*). The former helps in purchasing the land, building the farm premises, breaking up the ground and installing the plant required by the groups of settlers. The *Deutsche Siedlungsbank*, established in 1931, provides the funds for the intermediate settlement credits on short-term arrangements; there were RM. 456 million of this type of credit outstanding at the end of 1936. The Reich also finances this type of settlement directly.

The *Preussische Landesrentenbank*, on the other hand, deals in the extinction and substitution of intermediate credits by long-term credits, funds for this purpose being obtained through the issue of mortgage bonds (*Landesrentenbriefe*). Sums totalling RM. 260 million have been granted in this way. This bank also handles credits of the same type granted by the Reich.

Credits to farm tenants. — A third kind of special agricultural credit is that accorded to farm tenants, who used to find it difficult to obtain loans because bills of exchange were the only form of guarantee they could offer. The law of July 9, 1926 (*Pächterkreditgesetz*) effected a radical change in the situation and made it possible for farm tenants to obtain credit. The law recognizes that farm tenants may pledge their stocks, but they cannot do so directly as security for a loan obtained, because such stocks are subject to a prior legal lien in favour of the lessor as security for advances made by him. Moreover, when movable property (*Fahrnis*) is pledged, German law requires the transfer of the article given as security to the creditor giving the loan. The law on credits for tenants (*Pächterkreditgesetz*) has overcome these difficulties by instituting a lien on the tenant's stock without requiring that a transfer be effected. All that is necessary is for the creditor and the tenant to deposit an agreement in writing (*Verpfändungsvertrag*) with the *Amtsgericht*. As in the case of a mortgage registered in the land book, the agreement must contain a statement of the amount of the loan, the interest rate and the term. This right of pledge is extended to all stock belonging to the tenant at the time when the agreement is deposited and to any which may be acquired thereafter. The creditor is also protected against loss resulting from a decrease in the amount of the stock or damage done to it. The law has given equal rights to the creditor's lien on the tenant's stock and to the lessor's legal lien on the same stock, so that when the

stock is sold the proceeds are divided equally. Only if one of the halves is not requested, then the whole stock is at the disposal of the other creditor.

However, not all credit institutions are allowed to benefit by the right of pledge on stock. According to the law, only certain institutes authorized by the special «Commission for farm tenants' credit» may enjoy this benefit.

The institute for credit to farm tenants must also be in a position to grant credit to the lessor for the conservation of the farms for which the loan is made and must be able to provide for their regular supervision as regards increased output.

Credits to tenant farmers have not, however, taken a very prominent place in the dealings of these institutes, and consequently since 1935 most of this business has been handled by a special institute entitled the *Deutsche Pachtbank e. G. m. b. H.* which operates throughout the Reich and supplies the needs of both the tenant and the lessor. In its financial report for 1937 this institute showed that some RM. 15 million had been granted as loans to farm tenants.

Special fund for encouraging German agriculture. — Among the special forms of credit, mention may be made of the funds obtained from the "Special fund for encouraging German agriculture" (*Sondervermögen zur Förderung der deutschen Landwirtschaft*). This fund was formed with the net profits of the *Deutsche Rentenbank-Kreditanstalt* and at present amounts to some RM. 40 million. It was used especially to subsidize the peasant farms which were unable to borrow on ordinary terms, although loans were indispensable if the farms were to be kept at the standard of efficiency required by the "production campaign". These loans, called *Betriebsaufbaudarlehen*, are granted at 2.5 per cent. interest and must as a rule be repaid within ten years. So far RM. 33 million have been loaned in this way and the State has put RM. 70 million at the disposition of the RKA for the above Fund.

IV. — Conditions under which agricultural credit is granted.

INTEREST RATE.

In Germany, the interest rates for personal credit within the organized credit market average 4.5 - 5.5 per cent. Uniformity in the fixing of interest rates has been assured by means of an agreement between the different groups of banks. For special purposes, such as the purchases of fertilizers, the rate is still lower, being somewhere in the neighbourhood of 4 per cent. Similarly, for credit based on real property, again within the organized credit market, a single rate of 4.5 per cent. has been fixed for the debtors of land credit institutions. For farms whose indebtedness is in process of reduction the rate is 4 per cent. for mortgages suitable for the investment of trust funds ⁽¹⁾ and 4.5 per cent. for others. The

⁽¹⁾ In Germany, by the regulations on agricultural debt reduction, in the case of every estate subject to the process of debt reduction, the first step was to calculate the capital value of the revenue deriving from the estate, thus constituting a limit to its indebtedness. The funds of minors could be invested in such estates to an amount not exceeding two-thirds of the capital value.

other groups of institutions for the granting of credit based on real property have adopted this reduction of the interest rate to an average of 4.5 per cent. The rates are no higher than for the credits granted by private individuals, measures indeed having been taken to adapt the rates of the latter to those of the organized credit market. It is estimated that the interest rate in private credit dealing does not generally exceed 5 per cent. In certain cases of credits contracted for meeting needs of urgent importance to the national economy, the State contributes to the payment of the interest charges in order to facilitate the meeting of these needs. The chief group of credits of this description is that falling under the heading of "credits for carrying out improvements", the rate for which has been reduced to 3 per cent. as the result of a State subvention granted for the purpose.

TERMS OF CREDITS.

The terms of credits vary as a rule from six to nine months for short-term personal credits and run to three or four years for medium-term personal credits, extended even to six years in the case of credits granted to the *Erbhöfe* by the rural banks.

As regards mortgage credit, a distinction may be made between credits redeemable over a term of years and those redeemable at fixed notice. Mention should be made of the marked tendency towards a preference for the former, as well as to convert the latter, which always represent a risk for the lender, into credits redeemable over a term of years.

GUARANTEES.

In discussing credits granted to farm tenants, mention was made of the special form of guarantee, namely, the privileged lien on stock, created under the *Pächterkreditgesetz* of July 9, 1926, to protect this type of credit. Other forms of guarantee used in Germany are represented by the transfer of the title of property on the object serving as security (*Sicherungsübereignung*), by the pledging of products (*Lombardierung*), by the right of pledge on products (*Früchtepfandrecht*), by the bill of exchange, by personal security and by the guarantee of the State.

In the case of the *Sicherungsübereignung*, the borrower must transfer to the lender the property rights of his movable goods, but retains the possession and use of these goods. The lender, in his capacity of owner, may then in case of retarded payment of the debt recoup himself by selling the goods in question.

In the case of the *Lombardierung*, the lender only obtains a right of pledge which allows him to sell the pledged object provided that the conditions laid down in the civil code have been observed.

The right of pledge on products was created by the law of November 24, 1934, aiming at providing the farmer with the credit necessary for purchasing

supplies of fertilizer and selected seed. The law was originally limited to a period of one year, but was extended from year to year until the 1939 harvest. The legal lien thus granted to the creditor is applicable to the produce ripening during the current season, regardless of whether it be produced from seed or by the use of fertilizers obtained on credit. All that is necessary is that it be the produce of the land belonging to the debtor, in his capacity of owner, occupier, usufructory or farmer of the agricultural undertaking in question. This lien enjoys a privilege over all existing real rights over the products. This is a departure from the principle that a right of pledge of an earlier date has priority over one of a later date, but is justified on the ground that, even after the removal of the quantities of produce required to cover the debts contracted for the purchase of seeds and fertilizers, earlier creditors are still better protected than if cultivation had been neglected for lack of guarantees for credits. The right of pledge on produce is created in connection with supplies of seeds and fertilizers made after November 30 and expires on April 1 of the year following the harvest if it has not been claimed earlier. The claim is applicable to the whole crop from the moment the produce is about to be harvested. Whenever harvesting commences either the creditor holding the pledge or the debtor may at any time, even before the term expires, request that enough of the produce to cover the repayment of the loan be set aside, marked as subject to the right of pledge and stored separately. In this case the right of pledge applies only to such part of the crop.

The creditor may recoup himself in several ways by exercising his right of pledge on the produce. He may request that the products he sold by public auction, he may sell them freely at a given price or he can choose another method such as taking over the products for himself on account of the loan.

The right of pledge on the produce is now widely exercised. Generally speaking its existence suffices and its exercise by compulsion is as uncommon as is that of the right of pledge on a farmer tenant's stock.

As regards the guarantee of a credit granted to owners of *Erbhöfe*, it should be mentioned that in case of bad management an ordinance of December 21, 1926, provides for the supervision, or when that is insufficient, for the management of the farm by some trustworthy person. In case of the loss of the title of *Bauer*, the former holder may also be deprived of the administration, the enjoyment, and, in certain cases, even of the ownership of the farm. These measures assure the regular running of the farms as also the observance of contractual obligations.

INTERNATIONAL CHRONICLE OF AGRICULTURE

LITHUANIA

Since Lithuania is an exporter of both animal and vegetal products, statistics of agricultural exports afford a fairly good idea of the economic position of farmers during the year under review. No farm accountancy statistics have as yet been published for 1938-1939, but it is to be expected that the agricultural situation in 1939 will prove to have been slightly more satisfactory than in 1937-1938

External trade.

In 1939 the value of exports of agricultural produce amounted to 182.5 million litas out of a total value of exports of 203.2 million, as compared with 184.9 out of 233.2 million litas in 1938 and 149.2 out of 208.3 million in 1937. The slight decline in the value of agricultural exports in 1939 was not due to a reduction in output but to the export difficulties which arose towards the close of the year as a result of the outbreak of hostilities. Moreover, exports of agricultural produce were adversely affected by the return of the Vilnius area which, owing to the backward condition of its agriculture, is not in a position to cover its own foodstuff requirements. Lithuanian exports of the principal agricultural products for 1938 and 1939, are shown in the following table

Principal Agricultural Exports from Lithuania.

(Million litas).

Year	Live pigs	Bacon, lard and other smoked or salted meat	Butter	Eggs	Grain	Flax fibre	Flax tow and waste	Linseed
1938	21.3	25.1	48.5	7.8	21.7	14.4	10.4	2.0
1939	23.5	30.9	41.6	8.2	13.8	15.1	15.3	4.2

The output and export of butter has been steadily increasing up to the present time, the 1939 output being larger than that of 1938 although grazing conditions were unsatisfactory owing to the drought of the former year, as a result of the war exports of this product declined very slightly, from 17,412 metric tons to 16,388 metric tons.

Measures relating to agricultural marketing and production.

MARKET CONTROL.

Small farms predominate in Lithuania. Even before the world depression, the Government had made efforts to group small farmers into large central organizations for production and trading, so as to enable them to place standardized products on

the home and foreign markets and to supply sufficient quantities of produce for the latter. The following three organizations were set up for this purpose:

(1) The Lithuanian Union of Farm Co-operative Associations (*Lietuvos Žemės Ūkio Kooperatyvų Sasunga*, abbreviated into *Lietukis*), one of the activities of this organization being to handle all cereal exports;

(2) The Central Union of Dairying Co-operative Associations of Lithuania (*Centralinė Lietuvos Pieno Perdirbimo Bendrovių Sąjunga*, abbreviated into *Pienocentras*), into the hands of which the control of all butter production for export and all exports of butter and eggs have now been concentrated.

(3) The *Maistas* Company, Ltd., whose shareholders are the State and the pig-breeders; this company handles the entire production of bacon and other forms of processed meat for export, as well as all the exports of meat preparations, slaughter animals and poultry.

A Government decision also entrusted the *Maistas* with the purchase of horses for export as from 1940.

Besides the three organizations referred to above, through which the Government as a rule exercises price control, there are three other organizations operating in Lithuania; the *Lietuvos Cukrus* Company Ltd., with the State and the sugar-beet growers as shareholders, founded in 1930, which has in its hands the entire production and importation of sugar; the *Linas* Union of Co-operative Associations, established in the autumn of 1939, the function of which is to bring under its control all exports of flax fibre and encourage the cultivation and rational processing of flax; and the *Sodyba* Co. Ltd., the principal shareholders of which are the *Pienocentras*, the *Lietukis* and the Society of Sugar-beet Growers and which was established in the autumn of 1939 to deal chiefly with the industrial processing and export of fruits and honey.

To improve the quality of agricultural products for export, the government has been supervising meat exports since 1925, butter and egg exports since 1927, linseed exports since 1925 and flax fibre exports since 1926; control measures were tightened up in 1934. The efficient supervision of exports is greatly simplified by the centralization of all agricultural products intended for shipment abroad.

To facilitate the supply of agricultural produce to the export markets when prices show a downward trend, the government has fixed a minimum price for the following products: pigs purchased by the *Maistas*, milk supplied to the co-operative dairies and to the creamery centres (all the co-operative dairies in the country belong to the *Pienocentras*); eggs purchased by the *Pienocentras* and cereals purchased by the *Lietukis*. With the collaboration of the three central organizations mentioned above, the prices of agricultural produce are thus maintained at a given level.

Mention should also be made of the Price Control Establishment set up in 1935, which fixes minimum prices for potatoes purchased by the distilleries and starch factories.

REDUCTION OF PRODUCTION COSTS.

To reduce production costs the Price Control Establishment also fixes the price of chemical fertilizers, bran, oilcake and other items essential to farmers.

The same purpose is served by the regulations concerning indebtedness and the reduction of timber prices to farmers compelled to alter the site of their buildings as the result of the consolidation policy.

STIMULATION OF AGRICULTURAL PRODUCTION.

Increased production of selected seeds and seed control. — In accordance with a plan which was put into operation in the spring of 1937 the Union of Agricultural Co-operative Associations of Lithuania — abbreviated into *Lietukis* — purchases selected seeds from the Lithuanian Agricultural Research Institute and sells them under contract to growers for propagation. The seeds produced by these growers are then sold to farmers at low prices by the *Lietukis*. The Chamber of Agriculture also grants subsidies for the purchase of threshing machinery. The various measures concerning seeds include the new regulations published on October 3, 1939, dealing with the control of the home seed market. Under these regulations no seeds of cultivated plants, whether grown in the fields or in vegetable gardens, may be sold on the market or by travelling salesmen, etc. The only persons authorized to sell seeds to consumers are those merchant owning suitable premises for the purpose and licensed by the Institute for Agricultural Research.

Progress of sugar-beet cultivation. — The *Lietuvos Cukrus* Company, Ltd. is now setting up a third sugar factory which will probably start working in the autumn. Many growers will thus be enabled to use a part of their land for the cultivation of sugar-beet under contract with the *Lietuvos Cukrus*.

Increased productivity of marshy areas and grazing lands. — Ever since 1938 the Chamber of Agriculture has been paying particular attention to an increase in production obtained from fields and pasture land. It has therefore granted subsidies for the purchase of seeds of graminaceous and leguminous fodder plants, as well as for the purchase of implements for meadow cultivation and has also established distributing centres for such implements and tractors. Field workers employed by the Chamber operate these tractors and disc harrows at a moderate cost for farmers owning property in the marshy areas.

Encouragement of stock-breeding and the dairy industry. — The Chamber of Agriculture is setting up service stations for stallions and bulls as well as for boar pigs and rams; it also organizes shows for young horses and cattle, awarding prizes for the best animals, and gives financial support to those stock-breeding associations keeping stud-books and to the milk control societies. The number of controlled cows rose from 34,041 in 1934-35 to 50,351 in 1938-39. A special law for the improvement of breeds of cattle and authorizing the Minister of Agriculture to institute the inspection of bulls, was promulgated on March 28, 1939.

To facilitate the construction of dairies and the provision of equipment for the manufacture of dairy products and for drilling artesian wells, the Government grants subsidies to the dairy co-operative associations through the Chamber of Agriculture; these associations may also obtain credit through the Land Bank at a reasonable rate of interest and on favourable condition of repayment.

As a result of the difficulties encountered in importing wool and woollen cloth owing to the outbreak of hostilities, special attention has been paid of late to the improvement of breeds of sheep and to increasing the country's sheep population. The Ministry of Agriculture has consequently established several stations for the rearing of merino sheep producing wool of a fine quality.

To encourage poultry farming, the Chamber of Agriculture is setting up controlled poultry stations, so that a sufficient number of eggs for hatching will be produced to meet the increasing demand of farmers for day-old chicks.

Land drainage. — Ever since 1921 the Ministry of Agriculture has been regulating water courses and cutting emissary canals in order to enable farmers to proceed to a complete drainage of humid lands on their property by means of open ditches and pipe drainage. The total area of land reclaimed by means of emissary canals during the period between 1921 and 1937 inclusive was approximately 416,000 hectares, or about 10 per cent. of the area devoted to agriculture. During 1938 and 1939 some 51,000 hectares of land were reclaimed. It should also be stated that farmers desirous of effecting the complete drainage of their property may avail themselves of the technical advice of the experts in agricultural improvement attached to the Ministry of Agriculture; they may also obtain subsidies from Treasury funds.

Land consolidation. — The land consolidation programme has removed the chief cause of the low productivity of the small and medium-sized farm. Between the years 1920 and 1937 inclusive, consolidation was applied in 6,096 villages covering a total of 1,491,475 hectares and creating 139,551 separate farms. In 1938-39 alone consolidation was employed in 891 villages covering 162,870 hectares, 19,523 separate farms being formed. The work of consolidation was resumed on a large scale this spring also in the redeemed Vilnius area. Farmers who have settled on separate farms since 1932 and are compelled to shift their buildings, as has been the case with more than half of the farmers in this category, receive a fixed quantity of building timber at 20 per cent. of the sale price.

Agricultural credit.

A law promulgated in 1934 and modified several times since then, protects farmers against forced auction sales of their farms in repayment of debts contracted with private credit institutions or private individuals prior to February 1, 1934. Another law promulgated on June 5, 1936, contemplates a reduction of farmers' indebtedness contracted with the Land Bank prior to January 1, 1938. The interest rate on mortgage loans was reduced in 1938.

Social policy.

Under the law of March 30, 1938, a fund was created with the Ministry of the Interior to provide subsidies as compensation for damage caused by natural disasters such as hail, storms and thunderbolts.

All farm workers, employees and casual labour, together with working farmers and their families are insured against accident under the law on insurance for accidents incurred in the course of farm work, promulgated on December 5, 1938.

As a result of the law of January 14, 1938, concerning public health work among the rural population, more than 200 health stations have been erected in Lithuania and the number is gradually being increased. A doctor and a midwife are attached to each station, the funds for operating the service being provided jointly by the Ministry of the Interior and the local municipalities.

The law concerning rural building operations, promulgated on June 5, 1939, and the regulations relative thereto, published on January 13, 1940, include rural hygiene measures. The regulations fix a minimum height for habitable rooms and a minimum distance between the manure dump and the latrine on the one hand and the drinking water well on the other.

PERU

With the outbreak of war in Europe the confused position at the beginning of the World War was recalled in Peru, and it was feared that economic difficulties would arise. However, in 1939 the situation in Peru was more satisfactory than in 1914. At the latter date Peru was still on the gold standard, with no note circulation, and measures had therefore to be taken to prevent the draining of gold from the country. Further, Peru's chief importance as an exporting country lay in her mining products, with a few agricultural commodities. Her output of essential agricultural products was inadequate, there were no industries, and her supplies of industrial goods were drawn entirely from Europe, as the neighbouring South American States were also not industrialized, while at the time exports of industrial products from the United States had not reached their present dimensions. Finally, Peru was not able to exploit her own existing possibilities of agricultural production. Owing to the peculiar relief of the country the coastal district on the Pacific Ocean, the mountain ranges of the Andes and the vast forests beyond the Andes each formed a separate economic area unable to exchange its products with those of other areas. To-day, after a quarter of a century, the position has entirely altered and Peru is equipped with a central bank, and a well-developed banking and currency system, while her financial position is sound. Agriculture has made great progress, particularly in the last six or seven years. Industry, while still in its initial stages, is now able in some fields, such as textiles, to satisfy a part of the country's requirements, while the remaining demand can be satisfied by imports from other South American countries, Japan and, most important, the United States of America. But, above all, the country is becoming to an increasing degree a unified economic region, where the different parts of the territory will be able, owing to the variety of their products, to complement one another. Instead of the two main railway lines with which Peru was equipped in 1914, the not very numerous short local lines (amounting in all to some 3,000 kilometres in 1911), and the inadequate road system, there is now a well developed system of communications, great roadworks linking the arable coastal areas to the stockraising mountain regions, the slopes of which are also in part used to grow crops other than those cultivated on the coast. The opening up of the tropical forest area has also been helped by these roadworks. Finally, and of great importance for a country where nature imposes almost insuperable limitations on transport, several airlines, some foreign and some national, effect regular communications, carrying not only passengers and light valuable goods, but also such commodities as coffee and even young livestock for breeding.

If, through the consolidation of her internal position, Peru could view the future with some degree of tranquillity, she also had some guarantee for the maintenance of her external trade in the fact that, unlike many other South American countries, her exports do not consist exclusively in agricultural products, her wealth in metals, important for war purposes, such as copper, and as tungsten, vanadium and molybdenum, of which she is one of the few exporting countries, placing her in a favourable position. She can rely on these products should a paralysis of the markets for cotton and sugar, her two most important agricultural products, occur. At the outset there was admittedly a reduction in trade owing to world events and the scarcity of shipping space; but this did not last for long. Even by November exports had reached 165,249 metric tons with a value of 32.5 million sols ⁽¹⁾ against 185,427 metric tons with a

(1) For the value of the sol see note 1, p. 237.

value of 30.5 million sols in November 1938. Shipping communications were resumed by Italian, and in part by British, ships, and at the close of 1939 exports for the whole year were only 255,000 metric tons below the 1938 level, while their value was higher by 39.3 million sols.

While foreign trade recovered thus unassisted, the Government only intervening temporarily by supporting the sol through the Central Bank, measures were taken immediately on the outbreak of war to prevent rises in prices. By a law of September 3, 1939 ⁽¹⁾ the Government was empowered to restrict the freedom of trade and industry and to regulate the prices of essential commodities. The law also prohibits the discharging of workers, the lowering of wages and salaries and the export of essential commodities without official permission. The application of the measures of regulation and control was entrusted to a commission (*Junta de Subsistencia Social*) appointed simultaneously with the enactment of the law ⁽²⁾.

As a result of these measures and of the fact that, as far as imported goods were concerned, importers were supplied with stocks for from six to eight months, it was possible to avoid any large increase in prices. From the beginning of September 1939 to the middle of January 1940, in fact, the cost of living index rose only a few points. Nevertheless, on January 13, 1940 the government was empowered by law to take any measures necessary to reduce the cost of essential commodities, such as the lowering of tariff rates, the raising of bank credits, cancellation of contracts. A bill placed before the Senate at the same time further empowered the government for the duration of the war to requisition foodstuffs stored by producers of other persons, to pay a price such as to cover the cost of production and assure an adequate profit, and to retail these goods to the consumers direct.

Foreign Trade.

During the world economic crisis Peru's foreign trade shrank rapidly, but the trade balance remained active so that Peru did not have to introduce exchange and trade control as other South American countries have done. Peru withstood the recession in 1937-38 relatively well. When the recession began, in September 1937, Peru had already sold the great part of her cotton harvest for that year at good prices, while sugar, the agricultural product coming second in importance, held better than in previous years; and metal prices were not altogether unsatisfactory. Mining, however, is very largely in the hands of foreigners, so that increased profits benefit Peru chiefly in the form of government revenue, whereas cotton is grown exclusively by the Peruvians, and mainly by small farmers. The yield and marketing of this product are therefore of great importance for the country economically. Thus it can be said that in 1938 there was an economic crisis in Peru, since exports of cotton yielded only 65 million sols, against 94 million sols in 1937. This drop was due not only to the lower prices on the world market, but also to disease and damage which seriously affected the quality and volume of the harvest. In 1939 there was a recovery so that for the first nine months of that year the economic situation could be described as satisfactory.

⁽¹⁾ *El Peruano, Diario Oficial*, IV Quarter, No. 243 (October 27, 1939).

⁽²⁾ *El Peruano*, IV Quarter, No. 244 (October 28, 1939).

Development of Peru's Foreign Trade with her Chief Commercial Partners in 1936-39.
(in 1000 metric tons and million sols)

	1936		1937		1938		1939		1938		1939	
	1000 tons	million sols	1000 tons	million sols	1000 tons	million sols	1000 tons	million sols	1000 tons	million sols	1000 tons	million sols
AMERICA												
<i>United States</i>												
Imports from	145.6	63.9	187.9	83.4	160.7	89.2	146.4	105.1	130.6	67.4	94.7	67.5
Exports to	105.1	64.8	157.1	81.3	183.0	91.7	155.6	115.8	111.8	61.8	90.3	79.8
<i>Argentina</i>												
Imports from	116.9	17.2	97.9	19.1	116.2	15.9	124.0	13.9	80.9	12.3	99.5	10.4
Exports to	45.5	2.4	335.5	18.5	440.0	26.7	336.1	22.1	310.5	18.5	249.1	16.0
<i>Chile</i>												
Imports from	44.6	4.9	29.1	4.9	30.9	5.2	29.4	5.4	22.3	3.9	21.0	3.8
Exports to	203.1	17.5	230.9	22.1	212.5	20.7	228.4	30.0	157.8	15.1	158.1	19.7
ASIA												
<i>Japan</i>												
Imports from	17.6	7.9	17.1	8.1	23.0	8.7	25.3	8.0	16.7	6.2	18.8	5.5
Exports to	16.3	14.1	21.7	3.9	8.0	2.0	12.8	9.1	1.5	0.2	9.7	5.8
EUROPE												
<i>Germany</i>												
Imports from	90.7	39.0	106.3	46.3	64.4	52.8	47.8	37.6	43.7	38.0	44.9	34.9
Exports to	138.3	40.7	218.5	49.9	174.9	36.1	107.4	22.8	129.7	26.1	107.4	22.8
<i>United Kingdom</i>												
Imports from	24.1	26.9	25.9	24.1	23.0	26.3	18.4	21.5	18.2	18.2	14.9	17.5
Exports to	506.3	75.9	433.7	83.2	184.9	68.4	228.9	74.9	122.5	43.3	164.8	51.2
<i>France</i>												
Imports from	1.5	4.0	2.2	4.8	3.3	7.0	4.2	9.1	2.6	5.3	4.0	8.4
Exports to	573.8	34.5	411.5	26.6	314.4	21.8	274.6	21.3	226.4	14.8	210.6	16.3
REMAINING COUNTRIES												
Imports from	114.0	36.7	104.0	44.5	129.2	55.1	105.0	55.2	91.2	37.9	80.0	41.6
Exports to	1,170.0	85.9	967.1	79.9	825.6	74.7	744.0	85.4	637.3	55.0	605.5	61.8
Total imports	555.0	200.5	570.4	235.2	550.7	260.2	500.5	255.8	406.2	189.2	377.0	189.6
Total exports	2,758.4	335.8	2,776.0	365.4	2,343.3	342.1	2,087.8	381.4	1,697.5	234.8	1,595.5	273.4

(1) *Anuario del Comercio Exterior del Perú* for 1937 and 1938. Callao, 1938 and 1939. — *Boletín de Aduanas*, September 1938 and September 1939.

Value of Peruvian Exports from 1936 to 1939.(Million sols) ⁽¹⁾

Products	1936	1937	1938	1939	1938 9 months	1939 9 months
Mining products ⁽²⁾	188 7	210 2	222 6	227 4	158 7	172 0
Agricultural produce:						
Vegetal ⁽³⁾	125 2	130 0	93 8	125 8	57 9	80 2
Animal ⁽⁴⁾	16 9	22 4	17 5	21 6	11 3	15 8
<i>Total . . .</i>	142 1	152 4	111 3	147 4	69 2	96 0
Other products	5 0	2 8	8 2	6 6	6 9	5 4
<i>Grand total . . .</i>	335 8	365 4	342 1	381 4	234 8	273 4

⁽¹⁾ In considering these figures it should be remembered that the sol has been falling steadily in value. The rate of exchange fell from 3 sols per dollar in 1936 to 3 89 in January 1937, 4.12 in December of the same year, 4 96 in December 1938 and 6 18 in December 1939.

⁽²⁾ Petrol and its derivatives, gold and silver, copper, lead, zinc, tin, vanadium, bismuth, tungsten, molybden, antimony, sulphur and manganese.

⁽³⁾ Cotton and its derivatives, sugar, coffee, coca leaves and cocaine, vegetal ivory (*tagua*) wood, pimento (*Aji*) and cinchona.

⁽⁴⁾ Wool, hides and skins, horns.

Peru's exports to the *United States* consist chiefly in metals, guano (in so far as this is still exported) and sugar, while from the same country she imports industrial products of all descriptions (machines and tools, manufactured iron and steel, sheet metal, plant protection materials, medical and toilet goods), foodstuffs (*e. g.* wheat and wheaten flour) and lubricating oils. Peru's exports to *Argentina* consist mainly in petroleum and coca leaves, against imports of wheat and tanning materials. *Chile* imports from Peru sugar, cotton and cottonseed and petrol, supplying in exchange wood, wheat, oats, fruit and artificial fertilizers. To *Japan* Peru exports alpaca wool, cotton and copper, importing against these preserved fish, tea, textiles and underwear, plant protection materials and numerous other industrial products. *Germany* takes *inter alia* skins and hides, wool, sugar, coffee, cotton, gas oil and petrol, and supplies Peru with industrial products. The *United Kingdom* imports skins and hides, wool, sugar and cotton, metals and petroleum, her exports to Peru consisting in the first place in coal and industrial products. Finally, *France* buys wool, coffee, cotton and petroleum from Peru in exchange for silk, olive oil, wines and liquors, fertilizers and manufactured iron and steel, etc.

Measures relating to agricultural production.

NATURAL CONDITIONS OF AGRICULTURAL PRODUCTION.

As remarked before, Peru falls naturally into three clearly defined regions: the coastal region on the Pacific Ocean (*Costa*), the mountain range of the Andes (*Sierra*) and the tropical forests of the Amazon (*Montaña*). Frequently a division into five

regions is met with in the descriptive literature, the *Sierra* being subdivided into the mountains proper and the western and eastern slopes.

The coastal region (about 180,000 square kilometres of the total area of 1,249,049 square kilometres) is a region in which, owing to the cooling of the sea through the cold Humboldt Stream which prevents the evaporation of the sea water, and to the blocking of the moist winds through the Andes range, rain may not fall for years at a time. The coast is therefore a desert, except in the valleys of the many rivers flowing down from the mountains and in the irrigated areas where, in contrast, it is very fertile. The main crops in this area are cotton, sugar-cane, rice, maize, wine, olives and tobacco.

The *Sierra* is formed of the mountain ranges of the Andes, which cuts through the country from North to South, with two and at some points three ranges, the summits reaching up to 6,000 metres in height. The mountains are cleft and fissured, valleys with a tropical climate lying deep between mountain ranges, ravines, icily cold plateaux all alternating one with another; and these, with every type of climate and temperature, offer the possibility of many different types of cultivation. In the low-lying valleys and at the foot of mountains fruit, cacao, coffee, coca, sugar-cane and cotton are cultivated; in the ravines higher up, where the climate is more temperate, maize, wheat, barley, oats and potatoes are grown. On the plateaux animal husbandry is practised, but on the higher of these the only possibility of success is with *quinoa*, an indigenous cereal, and the native potato, together with the rearing of llamas, vicunas, guanacos and special breeds of cattle and sheep acclimatized to these heights.

Finally, the *Montaña* (almost a million square kilometres) has a hot tropical climate with a heavy rainfall. It is covered with extensive forests whose numerous types of tree have not yet all been botanically classified. The main product of this area was originally rubber, but this is now only of small importance in Peru, owing to the progress made elsewhere by plantation rubber, which at present supplies 90 per cent. of the world output. The enormous wealth in wood, the possibility of producing every type of tropical plant and the size of the territory itself make the colonization of this practically uninhabited region tempting. Hitherto, however, the climate, which is almost insupportable for white men and the mountain population of the Andes, and the lack of communications with the coast, have militated against settlement. But within the *Montaña* transport could easily be effected by the network of navigable rivers. Exports of the few products so far supplied by the *Montaña* take place via the Amazon port of Iquitos which lies some 4,250 kilometres up river, but which can, all the same, be touched by ocean steamers from New York, Hamburg and Liverpool.

ORIENTATION OF PRODUCTION.

Exports of, and so the interest shown for different primary products, has changed repeatedly over the last centuries. At the time of the conquest and throughout the whole colonial period interest was principally directed to the countries supplies of gold and silver. In the nineteenth century it turned to saltpetre in the South and to guano in the islands lying off the Peruvian coast. In the war with Chile of 1884, however, Peru lost the whole of her nitrate fields and part of the islands containing guano, and of what remained of guano very little is exported. Rubber and Peruvian bark, which formerly constituted important items of Peruvian exports, have been substituted on the market by Asiatic products. Other articles, on the contrary, have only recently come to play an important part in export. Such are cotton of which the export used

to be previously smaller than those of sugar, and the bismuth, of which the production in Peru began only since 1929, but for which to-day that country has become the world's largest supplier.

VEGETAL PRODUCTS.

Cereals. — Peru meets about 40 per cent of her ever-increasing requirements in wheat by her own production. Wheat cultivation is being protected by high import duties. The main wheat growing regions are situated in the *Sierra*, where it can be grown up to an altitude of 3,900 metres. In smaller quantities it is grown also in the Amazone region as well, and since 1936 the Government actively promotes wheat growing in the Northern coastal regions, most of all in the departments of Lambayeque and Libertad, where an over-production of rice is being feared. Parts of the soil under rice and of the soil less adapted for cotton growing in these regions have been diverted to wheat cultivation. Along the coast wheat growing has been given up almost entirely since about 1680 as a result of mildew. The assumption that the Khapli variety was a mildew resisting wheat was disproved by the exceptionally wet year 1938-39. Much is being expected now from the new variety—Kenya Crossbred 6040—which is supposed to resist better than Khapli to disease, to render better returns and to possess higher baking qualities. The total area under wheat cultivation in 1936 was 107,727 hectares, in 1937, 114,273 hectares, and in 1938, 122,000 hectares. The output during these years was about 82,000, 90,000 and 103,000 tons. Wheat imports during the same years were 121,000, 124,000 and 125,000 (including wheat flour) respectively.

Barley. — Is grown at altitudes ranging from 4,000 to 5,000 metres and constitutes, together with quinoa, called also Peruvian rice, the main food of the Indians in the *Sierra*. It is also used for making bread; quinoa blent with imported wheat makes excellent bread. This indigenous plant grows even at an altitude of 4,500 metres and makes modest demands upon the soil.

Maize. — Grows in Peru on almost every altitude and can be sown and reaped all the year round. Together with rice and potatoes it forms the chief food of the poor classes in vast regions of the country. Its quality is excellent and its output is sufficient to meet the needs of consumption. Insignificant quantities are exported to Central America.

Rice. — Especially of the Carolina and Jamaica varieties, is more extensively cultivated in the Northern departments of Lambayeque and Libertad, where its growth is largely dependent on the existence of water, in the South of the department of Arequipa and recently also in the Amazone region in the department of Loreto, where moisture conditions are more favourable. Before the Great War the output was not very large in Peru, but its consumption was also smaller than it is now and rice of high quality was exported to Chili and Ecuador. At the beginning of the Great War rice export was prohibited in order to provide for the food requirements of the country and low rice prices were fixed. After the Great War the consumption increased noticeably, but this did not entail a corresponding expansion in production which had been reduced by low prices, and until 1928, Peru imported every year, mostly from China and Siam, over 30,000 tons of rice for an amount of 7 ½ million sols. In 1928

high import duties were introduced in order to protect national production. In 1928 it had covered an area of 30,104 hectares and yielded 36,623 tons of decorticated rice; in 1929 its production increased at once to 57,658 tons harvested from 47,451 hectares. Imports, on the other hand, fell from 28,441 tons for the value of 322,000 sols to 12,667 tons for the value of 2,693,000 sols. In the years of very good yield, in 1932 and 1933, Peru was even in a position to export rice again. But figures for the cultivated areas, and for production, and consequently for eventual import requirements or exportable surpluses vary greatly according to the amount of rainfall in the year concerned. In 1938 the cultivated area was 41,965 hectares, the production 56,257 tons of decorticated rice and the imports amounted to 32,559 tons (in terms of decorticated rice), whereas in 1939 there was again an export of 100 tons for the value of 20,192 sols. The problem of Peruvian rice culture does not consist any more, as it did in 1928, so much in satisfying home consumption, which is generally covered in the years with sufficient rainfall, as in lowering prices by means of a reduction in the cost of production.

In order to protect the consumer, in April 1935 the Government fixed maximum prices for the home market and, at the beginning of 1937, worked out a classification of varieties of rice to which these prices had to be applied.

Sugar. — Sugar-cane culture was introduced from Mexico to Peru in the XVI century. Owing to favourable climatic conditions and the almost complete absence of sugar-cane disease it could develop there very well. It can be cut only when 12 to 18 months old, but after this period, it can be harvested for five to seven years running, no new plantations being necessary. The sugar contents are especially high. The harvest is done all the year round; hence, unlike other countries cultivating sugar-cane, Peru avoids long periods when machines remain unutilised and workmen unemployed. Sugar-cane culture is practiced mostly in the departments of Lambayeque and Libertad in the North of the coast, as well as in the low valleys of the Andes. In times past sugar-cane used to be grown on small holdings, but since the sugar crisis, to which the small grower was naturally less able to resist than were the large planters who had their own sugar factories, the small holdings were absorbed almost entirely by the planters. During the period 1912 to 1929 the cultivated area rose from 37,129 hectares to 77,987 hectares, but since 1929 it fell again to 53,000 hectares in 1929, and the sugar output, which was 428,355 tons in 1929 dropped to 355,962 tons in 1938. The home consumption is about 74,000 tons. The export fell to 312,490 tons in 1937, 249,920 in 1938 and 272,179 in 1939. When in 1937 the International Sugar Conference set out to regulate the world market, Peru was assigned a quota of 330,000 tons to part of which it renounced spontaneously. Accordingly, after this renunciation and the subsequent general 5 per cent. reduction of quotas, Peru was entitled to a share of 270,750 tons in the free world market. This same year Peru succeeded in increasing her exports to the United States, which is a highly important market for this country. The United States use to distribute at the end of the year the total sugar imports for the following year among the foreign countries from which she buys. However, in 1937, it had been decided that, should the Philippines renounce to the 60,000 short tons subject to the custom duties to which it was entitled in excess of the 970,000 to be imported free of duty, this amount would be allocated to other foreign sugar suppliers of the United States, Cuba excepted. Such an allotment had taken place every year since 1937, and the sugar quota for Peru, which had been fixed at the beginning of the year at 5,000-6,000 tons, suddenly increased towards the end of the year to about ten times this figure. For 1940 this quota had been fixed at 5,942 tons. But the prevailing war conditions made the purchase

of its sugar difficult for the United Kingdom, who is a very important buyer, Peru's demand for a market in the United States grows imperative and it endeavours to obtain a higher quota and a reduction of the import duty which is at present 1.87 ½ dollars per 100 English pounds avoirdupois, whereas Cuba is paying only 90 cents for the same quantity and is entitled to a quota of 1,923,680 tons for 1940.

Fruits and Vegetables. — Owing to great differences of its climatic conditions, as well as of altitudes, Peru produces a great variety of fruit, such as pears, peaches, plums, strawberries, raspberries and wild blackberries, figs, medlars, grapes, oranges, bananas and dates. The grapes of Southern Peru ripen at a period when the market of the countries situated southwards is badly supplied with fruit and consequently they sell well there. Excellent oranges have already been exported in refrigerating chambers to the United Kingdom and the United States. The statistics of exports also include almonds, chestnuts, melons and water-melons, alligator pears and pine-apples. The export of fruit is on the increase: it was 437 tons in 1937, 557 in 1938 and 807 in 1939. The coastal area and inland valleys offer favourable conditions for vegetable growing. Beans and peas, pimento and potatoes, should be mentioned here. In hot areas manioc is grown from which tapioca is obtained. The exports of vegetable from Peru amounted in 1937 to 797 tons, in 1938 to 709 tons and in 1939 to 942 tons.

Wine. — Vine growing covers an area of about 6,400 hectares. The production of wine in 1938 was estimated to amount to 100,000 hectolitres and to 20,000 hectolitres of spirit. Since 1938, according to statistical data, small quantities of these two products are exported.

Olives. — The annual production of olives is estimated at 1,000 tons. Its export constituted in 1938 13 tons and in 1939 48 tons. The production does not meet the the country's requirements.

Coffee. — Coffee of a very good quality grows in the coastal valleys, in places sheltered by the *Sierra* and in the Eastern part of the *Montaña*. The production which in 1929 was only 6,000 tons increased steadily since. There seems to be a tendency to extend the cultivation of coffee to soils formerly under coca plantation, as the market for cocaine is on the decline. The production of coffee covers home consumption and some is even left over for export, which amounted to 3,327 tons in 1937, to 2,463 tons in 1938 and to 3,355 tons in 1939.

Tea. — Experiments of tea cultivation have been carried out on seventeen plantations. Until now 13 ½ tons have been harvested annually, the quality of the product being satisfactory. Nevertheless the cultivation has not yet made great progress.

Cacao. — The cacao-nut grows wild in the *Montaña* and is cultivated in the valleys of the department of Cuzco. The annual productions recorded in 1929 was 190 tons. To-day it reaches 200-300 tons of an especially delicate product which is being consumed mostly within the country, although small quantities are exported to Bolivia.

Coca. — Comes on well especially in the valleys situated at 1000 to 2000 metres above sea level, on the surrounding slopes where it is cultivated on the terraces characteristic of Peru. The Indians have been accustomed to chew coca leaves for ages

and it is difficult to make an estimation of its total output, the native consumption being considerable and impossible to account for. The dried leaves are exported chiefly to Europe (Germany and the Netherlands) and to the United States. Their export amounted in 1937 to 187 tons, in 1938 to 275 tons and in 1939 to 308 tons, thus it has again been increasing during the last years, after having dropped to 94 tons in 1935. The cocaine manufactured in the country is sold mostly to Japan. Its export was 327 kilogrammes in 1937, 135 kilogrammes in 1938 and 255 kilogrammes in 1939. Hence there is a considerable decline since 1936, when it reached 943 kilogrammes.

Tobacco. — Since 1909 tobacco is a state monopoly. Its cultivation is subject to special licence. Peruvian tobacco is very strong and is generally mixed with milder varieties. The annual production of about 1000 tons does not cover home consumption. Experiments of growing Cuban and other varieties have been carried out.

Cotton. — As a cotton producer, Peru occupies the seventh place in the world. This plant is native of the country, and to judge from articles found in the graves, it used to be cultivated already in the Preincaic period. The great impulse, however, to increase cotton growing in Peru came for the first time during the American Secession War (1861-63), and the second time during the Great War. When, after the war of 1914-18, an over production of sugar led to a crisis in the world sugar market, cotton replaced sugar, which formed heretofore, the main export product of Peruvian agriculture. Peru became the most important cotton exporting country of Latin America until 1934, despite Brazil's much larger production which was largely absorbed by the home market.

The average production of cotton in Peru was 82,000 tons during the five years 1934-38. In 1938 the cotton area was 190,792 hectares and the production reached 85,885 tons. In April 1940, the new crop was expected to be satisfactory as regards quantity and quality. Although the growth of the national textile industry develops steadily, home consumption in Peru in 1938 did not exceed 6,262 tons. The exports were 80,752 tons in 1937 to the value of 88,8 million sols, 70,130 tons to the value of 60,6 million sols in 1938, and 77,194 tons to the value of 75,2 million sols in 1939.

By the law of October 19, 1939 ⁽¹⁾ a Chamber for Cotton has been founded for the purpose of studying and treating all questions concerning cotton trade.

Peru has taken part at the International Cotton Conference convened by the United States Government and held in Washington from September 5 to 7, 1939, on this occasion it put forward its point of view in favour of the limitation of the culture in order to obtain higher prices.

The seed and the derivatives of cotton constitute an important item of export. The export of seeds, oil, linters, etc. was in 1937 89,804 tons, in 1938 73,896 tons and in 1939 75,719 tons. Cotton-seed oil is also used in the country as edible oil.

Flax. — Considering that cotton growing is much affected by disease and pests, as well as by over-production, experiments have been carried out in Peru with a view to replace cotton by flax in the regions less suitable to the cultivation of the former. According to the law issued on June 1, 1939, a grant of 250,000 sols has been made

(1) *El Peruano*, IV quarter, No. 273 (December 4, 1939).

(2) *El Peruano*, III quarter, No. 154 (July 10, 1939).

for the promotion of flax cultivation. A special commission composed of experts has been appointed to deal with all questions concerning flax growing. Flax-growing experiments are carried out by the Experimental Station of La Molina.

Forest products. — The area under forests in Peru is estimated at about 70 million hectares. It is almost exclusively situated in the *Montaña* and contains a great variety of hard and soft woods. On account of difficulties of transport towards the coast, this great wealth is but little exploited, and the requirement of wood of the coastal regions are met by imports, mostly consisting of cedar and mahogany.

From 1909 to 1919 an average of 270,000 tons a year of wild *rubber* has been cropped. The downward trend of this branch of production is clearly demonstrated in the export figure of 1939, which amounted to 422 tons only.

The export of *cinchona-bark* is at the present moment very low. It has been cropped on the frontier of Ecuador from wild growing trees. Its cultivation is insignificant. Little attention has been given until now to the methods of harvesting and its stocking have been greatly damaged. The exports have been most adversely affected, as we have already pointed out by the competition of plantations in the Netherlands Indies. The export in 1937 was 100 tons, in 1938, 84 tons and in 1939, 67 tons.

ANIMAL PRODUCTS.

The *live stock* of Peru was estimated in 1939 in the following way: cattle, 1,850,000 heads; sheep 11,048,347; goats, 650,000; horses and mules, 400,000; asses, 200,000; alpacas, 1,169,372; lamas, 650,000 and pigs 800,000. The Association of stockbreeders in Peru (*Asociación de Ganaderos del Perú*) has made a point of improving the breeding of cattle and horses.

The national *meat* production is far from meeting the country's requirements, and great numbers of live stock as well as large quantities of preserved meat, are imported.

The export of *hides and skins* is in continuous progress. There is a specially high demand for goats kid leather because of their exceptionally fine quality. In 1937 3,881 tons of hides and skins have been exported; in 1938, 2,536 tons and in 1939, 1,217 tons.

Peru produces sheep wool and different species of lama's wools: the lama so called, which is domesticated, alpaca, wild vicuna and huarizos (a cross of the lama and the alpaca), as well as wool from the angora goat.

Exports of Wool from Peru from 1937 to 1939.

(in tons).

Year	Sheep	Alpacas	Huarizos	Lamas
1937	2,667	2,582	205	145
1938	2,332	2,920	210	113
1939	2,428	3,206	280	172

Vicuna wool is famous for its unique fineness and fetches very high prices, but the quantities exported are quite insignificant. For 1937 there exist no figures; in 1938 they were 1,558 kilogrammes, and in 1939 only 645 kilogrammes. The figures for angora goat wool are equally small; here again figures are missing for 1937, whereas in 1938 6,698 kilogrammes have been exported, and in 1939, 98 kilogrammes only.

The small quantity of sheep wool exported compared with the head of sheep finds an explanation in the fact that the animals are owned in the major part by natives who use the wool for making their own clothes, and consequently the greater part of the product is consumed at home. Moreover, a large proportion of the wool is not up to the world market standards of quality. The natives are not only lacking in necessary knowledge and understanding required in order to obtain an improvement of this quality, but they would not be in a position to benefit by it, as their simple spinning wheels and their weaving frames cannot work finer wool. Neither does the great greasiness of fine wool permit its dyeing with natural colours. Moreover, they prefer, contrary to the commercial taste, coloured wool which does not require any dyeing. In spite of that, together with the indigenous sheep (criollos), races giving high returns are being bred, such as the merinos and crossbreeds. In order to improve sheep-breeding the law of November 18, 1937 ⁽¹⁾ created the *Junta Nacional de la Industria Lanar* constituting a branch of the Agricultural Bank of Peru.

The wealth in fish in the coastal waters of Peru which hold many varieties of excellent fish, has been as little exploited as has been the great wealth of continental waters. Since a few years ago, steps have been taken to prevent large imports of preserved fish, which constituted in 1936 still 8.153 tons (8 079 tons of which came from Japan), but which fell since 1937 to 157 tons, in 1938 to 412 tons and in 1939 to 105 tons, as a result of measures taken in favour of promoting high sea fisheries and of breeding sweet water fish in the Peruvian rivers and in the Lake Titicaca. In collaboration with Bolivia, the Peruvian and Bolivian Institute of fishbreeding has been founded on the shores of that lake.

GENERAL MEASURES FOR PROMOTING AGRICULTURAL PRODUCTION.

Irrigation. — One of the main agricultural problems of Peru, we may say the outstanding one, is the question of irrigation. As afore-said, agriculture in the coastal zone is entirely dependent on water. A great number of small rivers are running down from the Andes into the Pacific Ocean and in these valleys cultivation is thriving on the water obtained from them. During the rainy season in the mountains these rivers swell, but the rest of the year they carry a small volume of water, and unless they take their source in the permanently snowbound regions, they sometimes dry up completely. The effect of the rains coming in time or being too late is reflected in the yield of the crops. According to observations recorded, periods of seven years of particularly heavy rainfall are preceded by arid years. During these years the cultures are affected by drought whereas during the years of great moisture they suffer from diseases and pests. Hence, necessity commands, to provide compensation by means of building of reservoirs and boring wells. At first sight irrigation seems less necessary on the slopes of the mountains, where, maize and lucerne excepted, the crops depend as a rule on natural moisture. But considering that rainfalls are irregular and often insufficient, here also irrigation would be equally useful. We do not exaggerate in stating that approximately three quarters of the entire Peruvian legislation deals with irrigation problems: preservation and extension of existing works, bringing of new land into cultivation by means of irrigation works, establishment of reservoirs, apportionment of water to interested parties, etc.

⁽¹⁾ *El Peruano*, IV quarter, No. 286 (December 23, 1937).

Legislative provisions concerning the production of foodstuffs. — According to a resolution taken by the President of the Republic on October 1, 1938, all the farmers of the provinces of Lima, Callao, Chancay, Cañete, Ica, Chincha and Pisco who have more than 10 hectares under cultivation are compelled to sow 5 per cent. of the cultivated area with foodstuffs of primary necessity, when they harvest twice a year, and 10 per cent. when they harvest only one crop. The cultivation should be made as far as possible in one plot. In the case of dairy farmers, grazing land is considered as answering this requirement; well kept orchards and vegetable gardens come within the range of the law, but during the following year, the latter will have to be supplemented by the cultivation of some other plant of primary necessity.

Provision of guano. — The guano was already known as fertilizer under the Incas and to a limited extent it was used throughout the colonial period. Its exploitation was, however, so limited, that on the islands along the Peruvian coast enormous quantities of these birds' excrements accumulated and, favoured by the entirely dry conditions of the region, they neither deteriorated nor decomposed. A large scale scheme was brought into operation only since 1840, and from 1841 to 1879 about 12 million tons were exported, which brought to the State a return of about 80 million pound sterling. In the course of time the stratum of guano began to be used up, and now it has to be exploited with greater care. The islands are exploited every two and a half years according to an established order. The birds (pelicans, cormorans, goëlands and others) are protected, and their ways of living studied in order to avoid anything which would cause them disturbance. In the same way fishing of fish on which they feed is being watched. The quantities taken away are strictly controlled, so as not to allow the annual increase to be exceeded. Only a very small quantity is exported; in 1938 the amount was only 16,698 tons from a total of 168,634 tons of nitrated guano and 1,167 tons of phosphated guano. The rest is disposed of within the country, in accordance with the fixed quotas. Up to recently, a scale of guano prices had been fixed according to the crops for which the guano sold was intended, which actually constituted a bonus for some particular crops (for example cereals for breadmaking). But in 1939 ⁽¹⁾ a uniform price was set up for the guano, and only the small holders subject to the regulation concerning the compulsory cultivation of foodcrops, are allowed a discount on the price of the guano they buy.

A. LENZ

BIBLIOGRAPHY ON ECONOMIC AND SOCIOLOGICAL SUBJECTS

MEERWARTH, Prof. Dr. R. *Leitfaden der Statistik*. Bibliographisches Institut A G, Leipzig, 1939. 159 pp.

[This little book by one of the leading German economic statisticians, whose "Nationalökonomie und Statistik" has served as a guide to many a student of empirical economics, is a useful addition to the working library of those economists who, without being versed in the intricacies of higher mathematics, have to use certain mathematical expedients in their researches. Particularly important in this respect is Chapter II of the book, which deals with statistical methods. Here, the author

⁽¹⁾ Law of January 12, 1939, *El Peruano*, I Quarter, No. 58 (March 13, 1939).

explains, with examples drawn from various fields of economic research, the basic principles and the working formulas of averages and measures of dispersion, of frequency curves and of the theory of correlation.

The selection of the essential concepts to be dealt with in the extremely limited space of this book is made in a masterly way. Yet, at one point the critical reader cannot help feeling some doubt. Indeed, in dealing with frequency curves, Prof. Meerwarth mentions the seven Pearsonian types of the Generalized Probability Curve, only to say that opinions as to their real meaning and value are widely divergent. Now, in a primer in which so much pain has been taken to explain the elementary concepts of mathematical statistics, these curves should either be left out altogether, or the essential difference between them and the normal frequency curve should be emphasised. It is true that the distinction between the empirical frequency curves, such as the Pearsonian ones, and the normal curve of error, is not always sufficiently stressed, even in such statistical treatises as Bowley's classical "Elements of Statistics" Jones's "First Course in Statistics" or Julin's "Principes de Statistique théorique et appliquée". In most cases, the authors would appear to be more interested in the mathematics and the general technique of the fitting of curves to sets of empirical observations than in their essential logical bases. This is hardly conducive to the development of clear thinking in the student. It ought always to be clearly stressed that, while the normal curve of error is an instrument of research which enables us to bring out the salient characteristics of mass phenomena, the Pearsonian curves are essentially descriptive. In economic research the normal frequency curve has its definite place as a means of analysis and a basis of generalization, but the Pearsonian curves are better reserved for use in other fields of research, such as biology and the other branches of natural science, in which the universe studied presents greater uniformity and the causation is simpler. There, and there alone, they can provide a legitimate basis for generalization.

In discussing the correlation of time series, Prof. Meerwarth does not mention the field of economic investigation in which the application of this method has played a particularly conspicuous part and has given rise to much controversy, namely, the study of economic fluctuations, and especially the problem of business forecasting, as conceived by Prof. Persons and by other representatives of the American school. Considering the amount of confusion which has been produced in this field of research by the not always discriminate use of the method of correlations, this is probably the best course to take].

G. P

SMITH, T. Lynn. *The Sociology of Rural Life*. Harper & Brothers, New York and London, 1940. (Harper's Social Science Series) XX + 595 pp., \$ 3.75.

[The author of this volume, in the preparation of his work, has evidently had in mind the difficulty in which the average reader finds himself when attempting to interpret views and theories relative to the social relations among the rural population. He has therefore deliberately expressed his ideas, given facts and explained controversial matters in as plain a style as would render his subject understandable to everybody. On the other hand his wide experience, the variety and extent of his research, the proper selection of illustrations, maps and diagrams best suited to clarify some of the fundamental factors of rural life make this volume of great value also for the expert student of sociological problems at large and in relation to agriculture in particular.

The volume is in 5 parts, dealing with rural conditions in many countries as regards the number, origin, distribution and importance of the rural population, its composition and special characteristics (health, fertility, mortality, migration); the rural social organization (form of settlement, land tenure, land settlement, the family, education, religion, political institutions and characteristic rural political organizations and government); the social processes in rural society (competition and conflict, co-operation, accommodation, assimilation etc., in rural areas; social mobility).

In the concluding part of his work the author expresses the opinion that modern means of communication have greatly reduced the differences between the urban and the rural communities, and a more homogenous society is in the making.

A number of practical exercises for students of rural sociology, covering all the matters treated in the volume, under the form of questions for use in the classroom, a large bibliography, and a subject and an author index conclude the volume.]

V. F

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(*) List of abbreviations: bihebd. (biweekly); bimens. (twice monthly); bimestr. (every two months); déc. (every ten days); étr. (foreign price); fasc. (copy); hebd. (weekly); int. (home price); irr. (irregular); mens. (monthly); n^o (number); N. S. (new series); p. a. (per annum); q. (daily); sem. (half yearly); s (series); trihebd. (every three weeks); v. (volume); trim. (quarterly).

N. B. — Between brackets [/] are given translations and explanatory notes not appearing in the title of the review.

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AGRICULTURAL STATISTICS

MONTHLY CROP REPORT AND AGRICULTURAL STATISTICS

The following explanations refer to crop conditions quoted in the crop notes and in the tables. — Crop condition according to the system of the country: Germany, including Ostmark and Sudetenland, Bohemia and Moravia (Protectorate); Hungary and Luxemburg: 1 = excellent, 2 = good, 3 = average, 4 = poor, 5 = very poor; Finland: 8 = very good, 6 = above the average, 5 = average; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = poor; Estonia, Latvia, Lithuania, Poland, Romania and Sweden: 5 = excellent, 4 = good, 3 = average, 2 = poor, 1 = very poor; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; Portugal: 100 = excellent, 80 = good, 60 = average, 40 = poor, 20 = very poor; Switzerland: 100 = excellent, 90 = very good, 75 = good, 60 = fairly good, 50 = average, 40 = rather poor, 30 = poor, 10 = very poor; U. S. S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = poor; Canada: 100 = crop condition promising a yield equivalent to the average yield of a long series of years; United States: 100 = crop condition which promises a normal yield; Egypt: 100 = crop condition which promises a yield equal to the average yield of the last five years. — For other countries the system of the Institute is employed. 100 = crop condition which promises a yield equal to the average of the last ten years

NOTE: The countries are listed throughout by continents (Europe, followed by the U. S. S. R., America, Asia, Africa and Oceania) in the French alphabetical order. In the tables the Northern Hemisphere precedes the Southern Hemisphere.

VEGETAL PRODUCTION

WORLD WHEAT PRODUCTION AND INTERNATIONAL TRADE

Very little new information on the results of the 1939 wheat harvest has been received by the Institute from European countries during January. Romania, Sweden and Finland have confirmed their previous estimates without modifying them. The final estimate for England and Wales shows a slight increase, of 2 million bushels, on the first estimate. For Germany also the revised figure shows a slight increase on the previous estimate. A recent statement of the Italian Government confirms that wheat production was as large as that of last year. The changes resulting from these various revisions are slight so that the total of European production remains practically the same as was estimated last month.

From North America has arrived the final estimate of Canadian production, slightly increasing the last estimate made in November, namely by 11 million bushels. It is thus confirmed that the most important exporting country in the world has had in 1939 an extremely large crop, comparable with the largest ever produced. Mexico has communicated to the Institute her first estimate, indicating that production was about the same as in 1938 and the previous five-year average. The aggregate production of North and Central America is raised, as a result of these reports, by about 10 million bushels above the figure estimated last month.

Turkey telegraphed on January 19 her first estimates of cereal production which are stated to be large in all cases. Wheat production, at 169 million bushels,

exceeds all former records; it represents an increase of 8 per cent. on last year, which was also a record crop, and of 50 per cent. on the average. Turkey, which in the last three seasons has exported an average of about 4 million bushels of wheat, this year should have a considerably larger surplus. Since Turkey's large crop exceeded expectations, the total of Asiatic production is raised by about 20 million bushels on last month. No other important change has occurred in regard to the countries of the Northern Hemisphere.

In the Southern Hemisphere, the third estimate of the crop recently harvested, has been received from Australia involving an increase of about 4 million bushels on the estimate of a month before, since the yield per acre was better than anticipated. Production is thus very large, being 21 per cent. greater than last year and 18 per cent. above the previous five-year average. Argentina will revise her December estimate only next month; it seems unlikely that this forecast will be raised appreciably, for, according to a cable sent by the Argentine Government on January 4, harvesting was advanced and threshing results confirm the exceptionally poor yields forecast in December. In Uruguay also, according to a cable of January 18, threshing results are generally low and irregular. In Chile crop prospects are about average. Aggregate South American production is thus very low; South America is the only continent which had a poor crop in 1939, all other countries reporting crops well above the average.

Wheat. - World Production by Continents (1).

(million bushels).

YEARS	Europe	North America	South America	Asia	Africa	Oceania	Total	U. S. R.
Averages.								
1923-27	1,244	1,210	277	497	108	143	3 480	677
1928-32	1 429	1,288	290	535	128	189	3 859	797
1933-37	1,580	901	278	581	133	166	3 639	1,206
Years.								
1938	1,829	1,295	400	680	140	160	4,504	1,494
1939 (forecast)	1,665	1,260	210	683	170	192	4 180	...

(1) Excluding U. S. S. R., China, Iran and Iraq

The table of world wheat production in 1939 has undergone only a few changes during January, estimates received by the Institute having been few in number and of minor importance. It should be borne in mind that the totals of the various continents, particularly those of Europe and Africa, are approximate calculations, for it has been necessary, in the case of some countries, to adjust the preliminary forecasts made at the beginning of the harvest and not since revised, and, in the case of countries which have suspended the publication of economic statistics, the gaps have had to be filled with approximate estimates. Owing to the number and importance of these missing figures, the totals of the various continents are not as precise as those of previous years,

but they provide all the same a reasonably accurate view of the 1939 crop and we reproduce the totals with a repetition of the necessary reserves.

In the same way as crop statistics, foreign trade statistics also show gaps and delays which cause increasing difficulty in estimating world trade movements. In last month's Crop Report the Institute was able to publish totals of net exports of the four large exporting countries and the Danubian countries for the first quarter of the 1939-40 season, from August to October. Although these figures do not represent the total of world wheat trade, they are not far short since the exports of the minor exporting countries only average 10 to 15 per cent. of the total in each season.

It was desired in the present Crop Report to give similar figures for the first four months of the season, from August to November. Unfortunately, the statistics of Australian exports in November have not been received. Nevertheless, we give in the following table the statistics of world exports, in view of their great interest, having filled the gap for Australia with an approximate figure and it may be considered that the actual total will not be very different from the figure given since the missing estimate refers to a single month only. But it is clear that if the gaps continue to increase, it will be necessary to cease altogether the publication of the figures referring to world wheat trade, as we have already ceased to publish the totals of European net imports

*World Net Exports of Wheat, including flour in terms of wheat *,
in the first four months (August-November) of the year.*

	Four months (August-November)		
	1939	1938	1937
Canada ¹	44	64	42
United States ¹	20	26	27
Argentina	62	18	12
Australia	13	24	21
Danube countries.	40	35	20
Total	184	167	131
Other exporting countries ⁴ . . . . .	...	39	42
Grand total . . . . .	...	206	173

* Aggregate net exports of the normal exporting countries (possible net imports into certain of these countries are not deducted from the totals).

(1) Net exports adjusted in accordance with the monthly variations in stocks of Canadian wheat in the United States and stocks of United States wheat in Canada. — (2) August to October only. — (3) Approximate total including a rough estimate of Australian exports in November. — (4) U. S. S. R., Poland, Lithuania, Algeria, French Morocco, Tunisia, India, Iraq, Iran, Turkey, Chile, Uruguay. — (5) Including 30 million bushels in 1938 and 27 million in 1937 from the U. S. S. R.

The total exports of the principal exporting centres during these first four months of the season were at a fairly high level, showing an increase of about 17 million bushels on the total at the corresponding period of last year and of 53 millions on that of 1937-38. The increase is almost entirely due to the exports of the Argentine Republic, which has disposed of large stocks of old crop wheat carried over from the excellent crop of 1938-39. Canada exported

about the same amount as last season, but a large part of these shipments have not crossed the ocean but remain in store in the United States for export during the winter months, when the majority of the Canadian ports are blocked by ice. The stocks of Canadian wheat at present in store in the United States have in fact risen from 7 million bushels at the beginning of August to 34 millions at the beginning of December. The exports of the United States, which were considerable at the beginning of the season, have progressively and considerably declined owing to the rise in the internal price of wheat, and thus remain well below those of the last two seasons. In spite of the fairly large supplies held in Australia, the exports of this country have remained low, principally owing to the poor demand of the Far East. The four exporting countries of the Danube basin have sent abroad very large quantities, owing to their heavy supplies and the increasing demand of European countries; over half of the exports of the Danube group have been supplied by Hungary, while those of Romania showed a considerable rise only in November.

For the minor exporting countries only a few figures are at present available, and these are not sufficient for estimating the total exports of this group. It seems, however, very probable that movements were much smaller than last year, owing mainly to Soviet exports which, it is generally believed, have declined considerably compared with the totals of last season and the season before. On the other hand, the exports of the countries of French North Africa, as a result of the very large crop of 1939, should have shown a considerable increase, but no precise information is available on this subject.

To summarize, the opinion may be expressed that even if the world trade in wheat during the first four months of the present season has not exceeded the total of the same period of last season, it has been very little inferior.

* * *

Normally, at this time of the year, the Institute is in possession of the estimates of autumn sowings for a certain number of European countries. Though incomplete, this information provided a first indication on the variations in the area under winter cereals. This year none of these estimates has reached the Institute and we are thus forced to fall back on general information collected from various sources. The general opinion seems to indicate that it was intended to sow larger areas to the bread cereals in the importing countries in order to increase the internal food supplies, and in the exporting countries in order to take advantage of the increased world price. The season has not, however, been favourable in all places owing to excessive moisture, which has hindered sowing, especially on low-lying land. If the winter and spring are favourable, mid-season and spring sowing will be greater but for the moment it seems that winter sowings will not exceed the area of last year in Europe as a whole. Germination and growth of the seedlings were on the whole satisfactory despite excessive moisture in some places. The beginning of the winter was marked by sudden falls in temperature but the severe frosts do not appear to have caused serious damage because in most areas there was a sufficient snow cover.

Some damage, however, has occurred in the Danube Valley, particularly in Hungary.

Sowings in the Soviet Union are apparently at the same level as last year. Growth began generally satisfactorily particularly in the south, where rainfall has been good. Snow fell everywhere during the winter, providing the fields with an adequate cover for the period of intense cold which sets in at the end of December.

As for the United States, it was known last month that winter wheat sowings were 3 per cent. smaller than last year owing to the drought in a large part of the winter cereal area. The crop situation varied from place to place and was rather poor on the whole at the beginning of December. Later there was an improvement owing to satisfactory precipitation in the zones which were most affected by the autumn drought. This precipitation however, was neither general nor heavy and in mid-January the western part of the Great Plains was still too dry. Forecasts of the new crop indicate a distinct decrease in production from last year.

In India the monsoon rains are late and the condition of the crop at the beginning of January was precarious in nearly all the important producing areas. If good rains come before the end of this month, however, the situation may get considerably better*. In the Near East and in Japan the situation is generally satisfactory.

In North Africa the season was generally favourable for sowing, and the cultivated area is expected to be at least equal to the very large area sown last year. Germination and growth are satisfactory.

The crop prospects for 1940 in the Northern Hemisphere appear to point to a rather light production owing to the reduced crops expected in the United States and India. Despite the heavy statistical position caused by the abundance of supplies and the poor world demand, the world wheat market has given some signs of recovery within recent months and prices have been increasing not only in the United States but on all export markets; while the poor crop of Argentina was initial cause of this recovery, its basis is the expectation of a poor world crop in 1940, an anticipation which seems at least somewhat premature.

G. CAPONE.

* A report has just been received that in the second decade of January good rains had begun to fall in the north of India.

CURRENT INFORMATION FROM VARIOUS COUNTRIES ON WHEAT, RYE, BARLEY AND OATS.

Germany: In the cereal tables there have been given, in place of the preliminary figures of the beginning of September, new figures of harvested area and the production in the Reich, including Memel, Ostmark and the Sudetenland.

Bulgaria: The wet and rather mild weather of the first three weeks of November was not, on the whole, favourable for the sowing of winter cereals, except in the south, where the rain brought considerable benefit to formerly drought-affected areas. In the last ten days of November and the first ten days of December there was heavy

Area sown to Winter Cereals, in thousand acres.

(The years indicated are those of the harvest)

COUNTRIES	WHEAT			RYE			BARLEY			OATS		
	1940	% 1940		1940	% 1940		1940	% 1940		1940	% 1940	
		1939 = 100	1934 to 1938 = 100		1939 = 100	1934 to 1938 = 100		1939 = 100	1934 to 1938 = 100		1939 = 100	1934 to 1938 = 100
Canada	813	117.5	114.1	766	128.3	119.8	—	—	—	—	—	—
United States	45,014	97.1	88.1	5,640	78.5	86.8	—	—	—	—	—	—
India	32,381	100.4	98.6	—	—	—	—	—	—	—	—	—

1) Rye for all purposes, including an allowance for spring-sown rye

rain and snow. The sowing of winter cereals was hampered by these weather conditions, but germination and the first growth was regular.

In the last ten days of December there was a gradual fall in temperature, which reached its minimum at the beginning of January. However, the young plants of winter cereals, being well protected from frost by a thick layer of snow, were not damaged and were growing in good conditions.

France: It was possible to continue wheat sowing almost throughout the second half of December and in some areas it had been completed. In the east and north sowing was retarded owing to the prolongation of work in beet fields. On the whole, it was estimated that seeding had been carried out over two thirds of the area of last year at this period, except in the north, and it was forecast that for France as a whole 90 per cent. of the normal area would be sown. In the last few days of December and the first days of January, adverse weather definitely compromised winter sowing not already carried out. Crop condition, however, was very good and it was believed that it would be possible to complete sowing again with spring wheat. (*Journal du Commerce*, Paris).

Greece: The weather of the first half of November was dry and not too cold in almost all parts of the country. The second half of November, however, was rather wet and cold. In certain districts in the mountains there were falls of snow. Sowing of cereals began this year in more favourable conditions than last year, owing the fine and mild weather in the first half of November; sowing continued very actively also during the second half of the month, in spite of the bad weather.

The weather in December was very variable. The first half of the month was marked throughout the country by south winds and rain with short but frequent intervals of sunny weather. The second half of December was very wet and towards the end of the month there were heavy falls of snow. These conditions hampered the sowing of cereals in the wetter parts of Thrace, Macedonia and Thessaly and in the other reclaimed parts of the country. In Epiros, continental Greece, Peloponnesos, Krete and the Islands sowing was nearly completed at the beginning of January. The germination and growth of the crops proceeded normally in all parts, with the exception of a few districts where sowing was late and plants were thin owing to excessive moisture.

Hungary: There were no frosts between December 15 and 28 but intense cold prevailed in the following two weeks. In the middle of January there was a thick

Area and Production of Wheat.

COUNTRIES	† AREA					† PRODUCTION								
	1939 and 1939-40	1938 and 1938-39	Aver. 1933 to 1937 1934 to 1937- 1938	% 1939 and 1939-40	Aver. 1938 and 1938- 1939 =100	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 1933-34 to 1937-38	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 1933-34 to 1937-38	% 1939 and 1939-40	Aver. 1938 and 1938- 1939 =100	
ooo acres					ooo cents		ooo bushels of 60 lb							
*Albania		95	98				990	998						
Germany ()	6,001	5,928	(*) 6,191	101.2	96.9	123,756	139,553	(*) 119,270	206,257	232,584	(*) 198,780	88.7	101.8	
*Belgium	354	430	399	82.4	88.6	...	12,079	9,556	...	20,131	15,926	...	...
*Bohemia Moravia (Protect.)	918	923	—	99.5	—	—	—	—	—	—	—	—	—	
Bulgaria	3,037	3,448	3,026	88.1	100.4	42,694	47,371	32,188	71,155	78,950	53,646	90.1	132.6	
Denmark	324	325	294	99.7	110.3	9,039	10,161	7,662	15,065	16,935	12,770	89.0	118.0	
Spain	8,795	—	() 11,145	—	78.9	67,065	42,417	(*) 90,683	111,773	70,694	(*) 151,136	158.1	74.0	
Estonia	186	172	160	108.2	116.4	1,779	1,883	1,565	2,965	3,139	2,609	94.5	113.7	
Finland	334	323	175	103.5	190.3	5,005	5,642	2,748	8,341	9,403	4,579	88.7	182.1	
France	() 11,683	12,479	13,118	97.6	89.1	—	223,723	179,792	—	372,864	299,648	—	—	
Greece	2,356	2,129	1,989	110.7	118.4	—	22,975	21,681	15,700	38,291	36,135	26,166	106.0	146.3
Hungary	(*) 4,669	4,000	3,910	—	—	(*) 67,660	59,267	48,643	(*) 112,765	98,777	81,070	—	—	
*Ireland	—	230	157	—	—	—	4,439	3,276	—	7,398	5,460	—	—	
Italy	12,841	12,426	12,541	103.3	102.4	176,370	178,394	160,229	293,945	297,317	267,043	98.9	110.1	
Latvia	378	348	333	108.6	113.7	4,380	4,231	3,944	7,300	7,052	6,574	103.5	110.0	
Lithuania	500	494	513	101.2	97.4	5,539	5,540	5,396	9,231	9,233	8,993	100.0	102.7	
Luxemburg	42	57	47	74.0	101.6	594	1,098	656	990	1,830	1,093	94.1	90.6	
Malta	10	10	9	97.3	100.1	167	177	163	279	296	271	94.4	102.9	
Norway	—	86	57	—	—	1,531	1,582	1,010	2,551	2,637	1,684	96.7	151.5	
Netherlands	306	311	355	98.3	86.2	7,981	9,563	9,368	13,301	15,918	15,613	83.5	85.2	
Poland	—	4,335	4,279	—	—	50,045	47,882	45,521	83,407	79,802	75,867	104.5	109.9	
*Portugal	—	1,334	1,304	—	—	—	9,481	10,221	—	15,802	17,035	—	—	
Romania	10,040	9,435	8,213	106.4	122.2	98,955	106,295	67,074	164,921	177,154	111,787	93.1	147.5	
Un Kingdom:														
England & W.	1,683	1,830	1,726	91.9	97.5	34,832	41,552	34,563	58,053	69,253	57,605	83.8	100.8	
Scotland	81	92	94	87.6	86.0	2,016	2,330	2,379	3,360	3,883	3,965	78.5	84.7	
N. Ireland	3	6	7	53.0	41.7	—	128	167	—	213	278	—	—	
*Slovakia	—	—	—	—	—	7,068	—	—	11,780	—	—	—	—	
Sweden	828	759	714	109.0	116.0	18,831	18,111	15,013	31,384	30,184	25,022	104.0	125.4	
Switzerland	200	195	164	102.7	122.3	3,816	4,687	3,291	6,360	7,812	5,484	81.4	161.0	
Yugoslavia	5,542	5,328	5,378	104.0	103.0	62,693	66,799	51,801	104,487	111,329	86,334	93.9	121.0	
Total Eur (\$)	53,779	52,525	50,607	102.4	106.3	740,658	780,854	633,656	2,344,086	1,301,401	1,056,141	94.9	116.9	
*U.S.S.R.	...	102,550	91,846	...	...	...	*897,000	723,604	...	*1,494,000	1,205,982	...	...
Canada (w s)	735	742	554	99.0	132.8	293,774	11,888	7,743	489,623	19,814	12,905	139.9	197.6	
United (w s)	26,021	25,188	24,500	103.3	106.2	—	198,118	140,950	—	330,196	234,916	—	—	
States (\$)	37,802	49,786	36,595	75.9	103.3	338,059	412,880	298,260	563,431	688,133	497,100	81.9	113.3	
Mexico	15,894	20,083	14,875	79.1	106.9	114,924	146,141	86,564	191,540	243,569	140,273	78.6	132.8	
Total N. Am	1,240	1,224	1,201	101.2	103.2	7,163	7,107	6,954	11,939	11,845	11,590	100.8	103.0	
	81,692	97,023	77,725	84.2	105.1	753,920	776,134	540,471	1,256,533	1,293,557	900,784	97.1	139.5	
*China	...	...	48,643	...	...	...	...	464,920	...	...	774,851	...	...
Cyprus	...	191	180	...	...	1,302	1,210	1,246	2,170	2,077	1,077	107.6	104.5
Chosen	...	846	808	...	...	7,372	6,241	5,566	12,286	10,401	9,277	118.1	132.4
India	35,289	35,640	33,982	99.0	103.8	222,365	241,114	213,718	370,608	401,856	356,197	92.2	104.0	
*Iraq	...	1,800	3,855	...	...	...	13,228	9,381	...	22,046	15,634	...	...
Japan	1,823	1,777	1,637	102.6	111.4	36,652	27,147	27,883	61,086	45,244	36,447	135.0	131.4	
Manchukuo	...	2,805	2,712	...	...	21,197	19,576	19,253	35,327	32,626	32,083	108.3	110.1
Palestine	500	441	515	113.4	97.8	3,000	980	1,929	5,000	1,633	3,215	306.2	155.5	
Syria & Leb.	(*) 1,429	1,404	1,313	101.7	100.8	(*) 13,382	14,205	9,745	(*) 22,303	23,674	16,241	94.2	137.3	
*Transjordan	...	...	...	...	...	...	1,876	1,600	...	3,127	2,666	...	...
Turkey	...	9,497	7,980	...	...	101,587	93,660	67,809	169,309	156,097	113,013	108.5	149.8
Total Asia (\$)	52,380	52,601	49,127	99.6	106.6	406,857	404,133	347,149	678,089	673,548	578,579	100.7	117.2	
Algeria	4,084	4,101	4,151	99.6	98.4	25,574	20,965	20,645	42,622	34,941	34,408	122.0	123.9	
Egypt	1,501	1,470	1,443	102.1	104.0	29,406	27,561	25,384	49,009	45,935	42,305	106.7	115.8	
Kenya ()	...	63	51	...	...	...	550	355	...	916	591	...	...
Libya	...	156	69	...	...	...	776	239	...	919	398	...	...
F. Morocco	3,188	2,999	3,213	106.3	99.2	23,259	13,903	14,599	38,764	23,172	24,331	167.3	159.3	
Tunisia	2,104	1,667	1,876	126.2	112.2	11,133	8,378	7,871	18,555	13,962	13,117	132.9	141.5	
Total N. Afr.	11,033	10,393	10,752	106.1	102.6	89,923	71,583	68,738	149,869	119,303	114,559	125.6	130.8	
Argentina	(*) 17,833	(*) 20,868	(*) 17,881	85.5	99.7	88,185	201,724	132,271	446,972	336,199	220,448	93.7	66.7	
*Chile	...	2,044	1,990	...	...	...	21,322	18,738	...	35,536	31,229	...	...
Uruguay	1,208	1,256	1,183	96.2	102.1	6,623	9,277	7,952	11,038	15,461	13,252	71.4	83.3	
Un. S. Afr. (*)	2,131	2,081	1,848	102.4	115.3	9,628	10,256	9,252	16,047	17,093	15,420	93.9	104.1	
Australia	13,500	14,224	13,091	94.9	103.1	111,926	92,726	95,231	186,543	154,543	158,719	120.7	117.5	
*N. Zealand	...	189	234	...	...	...	3,333	4,445	...	5,564	7,408	...	...
TOTALS (\$)	233,556	250,971	222,214	93.1	105.1	2,207,720	2,346,687	1,834,760	3,679,499	3,911,105	3,057,902	94.1	120.3	

Area and Production of Rye.

COUNTRIES	† AREA					† PRODUCTION							
	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40		1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40	
				1938 and 1938-39 = 100	Aver = 100							1938 and 1938-39 = 100	Aver. = 100
ooo acres					ooo centals			ooo bushels of 56 lb.					
*Albania.		8	7	...	...		72	79		129	141	...	...
Germany (1)	11,941	12,150	(2) 12,671	98.3	94.2	208,443	213,849	(2) 195,771	372,221	381,874	(2) 349,592	97.5	106.5
*Belgium	364	381	409	95.5	88.9	...	8,489	8,760	...	15,158	15,643	...	...
*Bohemia-Moravia (Protect.)	1,204	1,230	—	97.9	—	—	—	—	—	—	—	—	—
Bulgaria.	447	464	491	96.3	91.1	5,417	4,142	4,644	9,674	7,397	8,293	130.8	116.7
Denmark .	333	359	358	93.0	93.0	5,512	6,252	5,556	9,842	11,165	9,921	88.2	99.2
*Spain .	1,290	—	(3) 1,443	—	89.4	9,639	7,650	(3) 11,134	17,212	13,661	(3) 19,882	126.0	86.6
Estonia .	373	365	360	102.2	103.6	4,504	4,146	4,365	8,042	7,403	7,795	108.6	103.2
Finland .	568	583	591	97.4	96.2	7,297	8,124	8,187	13,031	14,507	14,619	89.8	89.1
*France . .	(4) 1,601	1,559	1,668	102.6	95.9	...	17,882	17,356	...	31,933	30,993	...	...
Greece . .	156	178	175	87.7	89.1	1,376	1,366	1,307	2,457	2,439	2,334	100.7	105.2
Hungary .	(5) 1,728	1,562	1,581	—	—	(5) 19,773	17,739	16,030	(5) 35,310	31,677	28,625	—	—
*Ireland . .	...	2	2	...	...	...	30	39	...	53	69	...	...
Italy . . .	260	257	270	101.2	96.3	3,339	3,040	3,301	5,962	5,428	5,895	109.8	101.1
Latvia . . .	737	709	664	104.40	111.1	9,473	8,349	8,105	16,916	14,909	14,474	113.5	116.9
Lithuania .	1,229	1,247	1,236	98.5	99.4	14,405	13,751	13,278	25,724	24,555	23,711	104.8	108.5
Luxemburg .	19	18	19	108.1	103.1	274	284	271	490	507	483	96.6	101.3
Norway . .	...	13	15	...	...	228	242	245	408	433	437	94.2	93.7
Netherlands .	557	601	501	92.7	111.1	13,228	12,149	10,259	23,621	21,694	18,319	108.9	17.9
Poland . . .	...	14,567	14,227	...	...	168,213	159,911	141,785	300,382	285,556	253,187	105.2	...
*Portugal .	...	331	365	...	...	...	2,269	2,299	...	4,051	4,105	...	...
Romania .	1,105	1,190	991	92.9	111.6	10,461	11,402	8,310	18,681	20,362	14,840	91.7	125.9
Un.Kingdom	...	...	...	...	...	...	...	...	...	...	...	...	...
* Engl. and Wales . .	...	16	14	...	...	...	240	194	...	428	347	...	...
*Slovakia . .	...	—	—	...	...	4,428	—	—	7,907	—	—	...	...
Sweden . .	463	498	551	92.9	83.9	8,340	8,922	9,583	14,894	15,933	17,112	93.5	87.0
Switzerland .	39	39	39	101.3	100.7	721	810	717	1,287	1,447	1,280	89.0	100.6
Yugoslavia .	650	640	643	101.6	101.0	5,369	5,007	4,627	9,587	8,941	8,262	107.2	116.0
Total Eur. (\$)	35,185	35,638	35,581	98.7	98.9	486,373	481,910	438,766	868,529	860,558	783,510	100.9	110.9
*U.S.S.R. . .	...	(10) 50,904	59,051	...	...	...	(6) 441,000	(11) 482,679	...	(6) 787,000	(11) 186,930	...	...
—
Canada . . .	1,102	741	701	148.6	157.1	8,572	6,153	3,197	15,307	10,988	5,708	139.3	268.2
United States . .	3,811	4,021	3,043	94.8	125.2	21,979	31,116	19,290	39,249	55,564	34,447	70.6	113.9
Total N. Am.	4,913	4,762	3,744	103.2	131.2	30,551	37,269	22,487	54,556	66,552	40,155	82.0	135.9
Turkey . . .	...	1,130	809	...	...	9,396	9,887	6,659	16,779	17,656	11,890	95.0	141.1
—
Algeria . . .	5	5	3	116.8	172.7	25	25	18	44	44	31	99.7	140.2
—
Argentina .	(9) 2,296	(9) 2,254	(9) 2,008	101.9	114.3	7,937	6,063	4,471	14,173	10,826	7,984	130.9	177.5
—
*U. of S. Afr. (8)	...	...	(11) 121	...	...	...	...	475	...	...	848	...	...
TOTALS . (f)	43,529	43,789	42,145	99.4	103.3	534,282	535,154	472,401	954,081	955,636	843,570	99.8	113.1

See notes on page 9.

Area and Production of Meslin.

COUNTRIES	† AREA						† PRODUCTION											
	1939	1938	Average 1933 to 1937	% 1939			1939	1938	Average 1933 to 1937	1939	1938	Average 1933 to 1937	% 1939					
				1938	Aver.								1938	Aver.				
															= 100	= 100	= 100	= 100
ooo acres						ooo centals			ooo bushels of 48 lb									
Germany (1) .	1,658	1,500 (2)	1,175	110.5	141.2		29,296	29,101 (2)	19,180	50,511	50,175 (2)	33,070	100.7	152.7				
Belgium . . .	4	4	8	87.4	48.5		...	90	96	...	156	166				
Bohem. & Mo- ravia (Prot.)	9	9	—	101.1	—		—	—	—	—	—	—	—	—				
Bulgaria . . .	198	258	249	76.8	79.5	2,596	2,902	2,726	4,476	5,004	4,700	89.5	95.2					
Denmark . . .	736	746	810	98.6	90.8	15,432	17,533	16,960	26,608	30,230	29,241	88.0	91.0					
Spain . . .	...	...	(11) 111	...	...	...	...	(11) 625	...	...	(11) 1,077	...	...			
Estonia . . .	313	209	195	149.6	160.4	3,093	2,460	1,894	5,333	4,242	3,266	125.7	163.3					
Finland . . .	24	24	35	103.2	70.8	353	392	535	608	675	923	90.0	65.9					
France . . .	(4) 188	188	182	100.2	103.5	...	2,482	2,075	...	4,280	3,578	...	...			
Greece . . .	153	156	136	98.3	112.9	1,191	1,122	840	2,053	1,934	1,449	106.2	141.7					
Latvia . . .	223	195	181	114.6	123.6	...	2,657	2,188	...	4,581	3,773	...	...			
Lithuania . .	267	277	260	96.3	102.9	3,014	3,279	2,788	5,197	5,654	4,807	91.9	108.1					
Luxemburg . .	3	4	6	65.8	42.6	39	68	92	67	117	159	57.6	42.2					
Norway . . .	...	11	12	...	...	209	236	218	361	406	375	88.8	96.2		
Poland . . .	...	326 (11)	337	...	...	...	3,924 (11)	3,551	...	6,766 (11)	6,122	...	...			
Un. Kingdom:																		
Engl and W.	83	92	97	89.7	85.7	1,613	1,658	1,716	2,781	2,858	2,958	97.3	94.0					
Sweden . . .	628	629	611	99.8	102.8	13,144	14,631	11,729	22,663	25,226	20,223	89.8	112.1					
Switzerland .	18	18	17	100.0	109.6	346	423	349	597	730	602	81.8	99.2					
Yugoslavia . .	...	169	154	...	...	...	1,334	1,186	...	2,300	2,044	...	...			
Canada . . .	1,218	1,159	1,156	105.1	105.4	19,957	17,622	16,221	34,409	30,383	27,968	113.3	123.0					
Turkey . . .	...	332	216	...	...	3,256	2,986	1,682	5,614	5,149	2,901	109.0	193.6		

NOTES FOR TABLES OF WHEAT, RYE AND MESLIN.

† The years indicated are those of the harvest, single years referring to the Northern Hemisphere, double years to the Southern. — * Countries not included in the totals. — (8) In calculating the totals account has been taken of the probable area cultivated in some countries for which estimates of production are available but not those of area. As the estimates for Hungary for 1939 include the areas and production of territories recently annexed by this country, the totals for Europe and the general totals for 1938 and for the average have been adjusted approximately to maintain the comparability of the series. — (w) Winter crop. — (s) Spring crop. — (1) Including Austria, Sudetenland and Mecklenburg. — (2) Average 1932 to 1937. — (3) Average of four years. — (4) Estimated on May 1. — (5) Present frontiers excluding Sub Carpathian Russia. — (6) Approximate calculated figure. — (7) Not including Alexandretta. — (8) Cultivation by Europeans only. — (9) Area sown. — (10) Area provided for in the Plan. — (11) Average of three years.

snow cover of 3 to 8 cm. in the greater part of the country and of 30 to 30 cm. in Sub-Carpathian Russia.

The first period was favourable for the development of winter cereals but the intense cold of the second period came when the crop were unprotected by snow with resultant damage in many places, particularly where sowings were late. The loss can only be estimated in spring when growth recommences.

In three provinces the area sown is 10 to 20 per cent. below normal and an increase is consequently expected in the spring sowings.

Ireland: The weather of the first half of December was comparatively mild, but rain was general throughout the period. The second half was fine and dry, with light frosts in the last week of the month. Conditions for sowing were reasonably favourable and were carried out at the usual period, but sowing was not completed at the end of the year. Conditions for braiding and growth were suitable, with an absence of severe frosts and of snow.

Area and Production of Barley.

COUNTRIES	† AREA						† PRODUCTION							
	1930 and 1939 1940	1938 and 1939- 1940	Average 1933 to 1937 and 1938- 1939- 1940	% 1939 and 1939-40		Average 1933 to 1937 and 1938-39	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1938-39	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1938-39	% 1939 and 1939-40	
				1938 and 1939- 1940 = 100	Aver = 100								1938 and 1938- 1939- 1940 = 100	Aver. = 100
ooo acres						ooo centals			ooo bushels of 48 lb.					
*Albania		13	13	...	...	...	92	131		192	274	...	...
Germany (*)	4,826	4,838 ^{a)}	4,717	99.7	102.3	93,956	105,822 ^{a)}	86,421	195,746	220,467 ^{a)}	180,048	88.8	108.7	
*Belgium	48	76	85	62.9	56.9	...	1,967	2,046	...	4,098	4,263	...	...
*Bohemia														
Moravia														
(Protect)	644	638	—	101.0	—	...	—	—	...	—	—	...	...
Bulgaria	563	555	549	101.5	102.6	7,359	7,821	6,495	15,332	16,294	13,532	94.1	113.3	
Denmark	1,021	982	876	104.0	116.6	27,337	29,970	22,132	56,954	62,438	46,109	91.2	123.5	
*Spain	3,321	— ^{b)}	4,615	—	72.0	30,863	16,270 ^{a)}	48,607	64,298	33,897 ^{a)}	101,266	189.7	63.5	
Estonia	208	717	248	95.7	83.6	1,834	2,133	2,009	3,821	4,443	4,186	86.0	91.3	
Finland	306	298	316	102.6	96.8	4,233	4,572	4,031	8,819	9,524	8,399	92.6	105.0	
*France	1,975	1,876	1,806	105.3	109.4	...	28,457	23,030	...	59,286	47,979	...	...
Greece	*) 532	*) 541 ^{a)}	*) 525	98.3	101.4	4,877	5,412	4,373	10,160	11,276	9,111	90.1	111.5	
Hungary	*) 1,344 ^{a)}	*) 1,121 ^{a)}	*) 1,150	—	—	*) 17,207 ^{a)}	15,961 ^{a)}	13,920 ^{a)}	35,849 ^{a)}	33,253 ^{a)}	29,002	—	—	
*Ireland	...	118	132	...	...	...	2,468	2,961	...	5,142	6,168	...	...
Italy	497	492	492	101.0	101.1	5,409	5,465	4,668	11,270	11,386	9,726	99.0	115.9	
Latvia	445	440	459	101.3	97.0	4,608	4,863	4,413	9,601	10,131	9,193	94.8	104.4	
Lithuania	516	519	516	99.3	99.9	5,439	6,041	5,486	11,332	12,586	11,430	90.0	99.1	
Luxembourg	5	5	6	106.9	84.9	75	67	78	156	140	162	111.6	96.1	
Malta (*)	5	5	5	97.6	97.8	98	102	99	205	213	207	96.1	99.0	
Norway	...	148	148	...	...	2,793	2,741	2,571	5,819	5,711	5,355	101.9	108.7
Netherlands	102	107	90	95.0	112.6	3,086	3,097	2,295	6,430	6,452	4,781	99.7	134.5	
Poland	...	2,910	2,963	...	...	32,629	30,233	31,401	67,977	62,986	65,420	107.9	103.9
*Portugal	...	186	173	...	...	...	860	872	...	1,791	1,816	...	...
Romania	2,708	3,158	4,123	85.7	65.7	22,168	18,347	27,375	46,183	38,223	57,032	120.8	81.0	
Un Kingdom														
Engl & W	910	885	809	102.8	112.5	17,780	17,987	14,573	37,053	37,473	30,361	98.9	122.0	
*Scotland	99	99	77	100.1	128.4	...	2,195	1,649	...	4,573	3,435	...	...
*N Ireland	3	3	3	101.9	138.5	...	74	56	...	153	117	...	...
Sweden	280	272	256	102.7	109.2	5,517	5,876	4,600	11,494	12,241	9,583	93.9	120.0	
Switzerland	12	11	13	107.1	92.3	187	203	169	390	423	351	92.2	111.1	
Yugoslavia	*) 1,045 ^{a)}	*) 1,049 ^{a)}	*) 1,073	99.7	97.5	9,349	9,287	9,059	19,477	19,349	18,872	100.7	103.2	
Total Europe ^{a)}	18,363	18,800	19,581	97.8	93.9	265,947	279,257	249,254	554,068	582,358	519,290	95.1	106.7	
*U S S R	...	20,599	20,714	...	...	...	*) 163,566 ^{a)}	167,899	...	*) 340,769 ^{a)}	349,797	...	...
Canada	4,347	4,454	3,985	97.6	109.1	49,511	49,076	35,148	103,147	102,242	73,224	100.9	140.9	
United States	12,600	10,513	9,390	119.9	134.2	132,623	121,442	88,706	276,298	253,005	184,805	109.2	149.5	
*Mexico	...	357	359	...	...	...	1,536	1,579	...	3,199	3,291	...	...
Total N Am.	16,947	14,967	13,375	113.2	126.7	182,134	170,518	123,854	379,445	355,247	258,029	106.8	147.1	
*China	...	...	15,881	...	...	...	...	166,179	...	...	346,212	...	...
Cyprus	...	115	113	...	...	1,035	913	938	2,156	1,902	1,954	113.4	110.4
Closen	...	2,738	2,571	...	...	29,314	24,528	25,021	61,072	51,100	52,128	119.5	117.2
*Iraq	...	2,533	1,562	...	...	...	25,097	8,807	...	52,286	18,349	...	...
Japan	1,879	1,892	1,894	99.3	99.2	39,200	30,807	34,727	81,669	64,182	72,349	127.2	112.9	
*Mauchukuo	...	265 ^{a)}	442	...	...	...	2,150 ^{a)}	4,054	...	4,479 ^{a)}	8,447	...	...
*Palestine	509	502	568	101.4	89.7	...	1,471	1,339	...	3,065	2,790	...	...
Syria & Leb	888	838	746	106.0	119.1	8,157	8,453	6,605	16,994	17,611	13,761	96.5	123.5	
*Transjord.	...	...	...	...	...	...	992	760	...	2,067	1,583	...	...
*Turkey	...	4,851	4,100	...	...	50,601	53,100	40,004	105,420	110,626	83,344	95.3	126.5
Total Asia	10,471	10,434	9,424	100.3	111.1	128,307	117,801	107,295	267,311	245,421	223,536	108.9	119.6	
Algeria	3,063	2,909	3,180	105.3	96.3	24,251	12,944	16,389	50,524	26,967	34,143	187.4	148.0	
Egypt	273	274	284	99.7	96.1	5,251	5,129	4,812	10,941	10,686	10,026	102.4	109.1	
*Libya	...	367	325	...	...	...	...	766	...	...	1,596	...	...
F. Morocco	4,720	4,155	4,160	113.6	113.5	46,915	23,937	25,353	97,740	49,869	52,819	196.0	185.0	
Tunisia	1,483	756	1,149	196.0	129.0	7,716	2,205	3,946	16,076	4,593	8,222	350.0	195.5	
Total Africa	9,539	8,094	8,773	117.9	108.7	84,133	44,215	50,500	175,281	92,115	105,210	190.3	166.6	
Argent.	*) (2,122)	*) (2,053)	*) (1,921)	103.3	110.5	...	...	...	...	...	...	...	...
*Chile	...	203	193	...	...	16,535	9,700	13,761	34,448	20,209	28,668	170.5	120.2
*Uruguay	61	52	26	119.1	—	...	2,402	2,627	...	5,005	5,473	...	...
— (10)	...	...	...	...	...	...	306	189	...	638	394	...	...
*Un. of S. Afr.	...	...	73	...	...	...	...	632	...	...	1,317	...	...
*N.Zealand	...	27	21	...	...	...	538	379	...	1,122	790	...	...
TOTALS \$	56,572	53,527	52,483	105.7	107.8	677,056	621,761	544,664	1,410,553	1,295,350	1,134,733	108.9	124.3	

See notes at the end of the following table.

Area and Production of Oats.

COUNTRIES	† AREA					† PRODUCTION							
	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40		1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40	
				1938 and 1938-39	Aver. 1938-1939 -100							1938 and 1938-39	Aver. 1938-1939 -100
ooo acres					ooo centals			ooo bushels of 32 lb					
*Albania	28	24	—	—	—	248	212	—	776	663	—	—	—
Germany (1)	8,102	7,917	8,356	102.3	97.0	151,407	158,954	144,624	473,144	496,727	451,946	95.3	104.7
*Belgium	603	527	571	114.5	105.7	13,692	15,361	15,361	42,738	48,002	—	—	—
*Bohemia													
Moravia (Protect)	894	904	—	98.9	—	—	—	—	—	—	—	—	—
Bulgaria	274	355	316	77.3	86.8	2,819	1,964	2,555	8,810	6,137	7,984	143.6	110.3
Denmark	916	926	932	98.9	98.3	22,487	25,225	21,548	70,272	78,829	67,337	89.1	104.4
*Spain	1,391	—	1,758	—	79.1	10,404	7,033	13,603	32,511	21,977	42,508	147.9	76.5
Estonia	357	368	345	97.1	103.6	3,329	3,891	2,925	10,403	12,160	9,139	85.5	113.8
Finland	1,206	1,143	1,141	105.5	105.7	17,593	18,423	15,171	54,978	57,572	47,409	95.5	116.0
*France	8,010	8,019	8,160	99.9	98.2	—	120,316	101,742	—	375,986	317,942	—	—
Greece (2)	373	383	340	97.4	109.8	3,343	3,362	2,477	10,447	10,505	7,741	99.5	135.0
Hungary	636	554	545	—	—	7,864	6,842	6,152	24,575	21,382	19,225	—	—
*Ireland	570	593	—	—	—	12,523	12,952	—	—	39,133	40,474	—	—
Italy	1,044	1,093	1,073	95.5	97.3	12,938	13,869	11,820	40,430	43,342	36,938	93.3	109.5
Latvia	935	860	798	108.8	117.2	9,927	9,846	7,913	31,023	30,769	24,727	100.8	125.5
Lithuania	859	838	854	102.5	100.6	8,856	9,259	8,108	27,675	28,936	25,338	95.6	109.2
Luxemburg	62	61	66	100.8	93.9	992	916	963	3,100	2,864	4,011	108.3	103.0
Norway	—	211	221	—	—	4,038	4,337	3,960	12,620	13,554	12,375	93.1	102.0
Netherlands	403	769	334	109.0	120.5	9,921	9,845	6,906	31,002	30,765	21,580	100.8	143.7
Poland	5,734	5,627	5,533	101.9	103.6	63,493	58,365	56,503	198,415	183,015	176,570	108.4	112.4
*Portugal	—	618	527	—	—	—	2,090	1,954	—	6,530	6,106	—	—
Romania	1,427	1,609	1,998	88.7	71.4	10,492	10,209	14,653	32,787	31,904	45,792	102.8	71.6
United Kingdom													
Ireland													
Wales	1,358	1,301	1,392	104.4	97.6	25,066	23,946	24,631	78,330	74,830	76,972	104.7	101.8
*Scotland	774	798	829	97.0	93.3	—	14,179	14,909	—	44,310	46,592	—	—
*N. Ireland	291	297	272	98.2	106.9	—	6,489	5,819	—	20,279	18,185	—	—
Sweden	1,647	1,647	1,639	100.0	100.5	28,328	30,441	26,610	88,526	95,127	83,154	93.1	106.5
Switzerland	30	28	29	105.6	101.2	564	560	464	1,764	1,750	1,451	100.8	121.5
Yugoslavia	910	917	925	99.2	98.4	7,645	7,199	7,103	23,891	22,496	22,195	106.2	107.6
Total Europe \$	26,484	26,306	26,938	100.7	98.3	391,102	398,755	366,188	1,222,192	1,246,109	1,144,329	98.1	106.8
*U. S. S. R.	—	41,196	43,544	—	—	—	349,163	386,399	—	1,091,128	1,207,488	—	—
Canada	12,790	13,010	13,538	98.3	94.5	130,698	126,270	106,295	408,432	394,593	332,173	103.5	123.0
United States	33,070	35,661	34,889	92.7	94.8	299,909	341,898	282,719	937,215	1,068,431	883,498	87.7	106.1
Total N. Am.	45,860	48,671	48,427	94.2	94.7	430,607	468,168	389,014	1,345,647	1,463,024	1,215,671	92.0	110.7
*China	—	—	2,522	—	—	—	—	19,108	—	—	59,712	—	—
*Cyprus	—	14	12	—	—	—	89	71	—	277	222	—	—
*Japan	—	337	303	—	—	—	4,523	3,682	—	14,135	11,505	—	—
*Manchukuo	—	242	86	—	—	—	1,193	775	—	3,727	2,421	—	—
*Palestine	—	2	2	—	—	—	9	15	—	28	48	—	—
Syria & Leb.	12	24	29	47.7	39.4	120	218	267	375	682	836	55.0	44.9
*Turkey	—	596	531	—	—	5,512	5,680	4,574	20,351	17,748	14,294	114.7	142.4
Algeria	516	451	457	114.5	113.0	4,850	3,486	3,234	15,157	10,892	10,107	139.2	150.0
Fr. Morocco	131	120	80	109.3	163.5	1,676	1,048	569	5,236	3,275	1,777	159.9	294.6
Tunisia	99	99	71	99.8	140.2	661	661	381	2,067	2,067	1,192	100.0	173.4
Total N. Afr.	746	670	608	111.9	122.8	7,187	5,195	4,184	22,460	16,234	13,076	138.4	171.8
Argentina (3)	(3,446)	(3,361)	(3,292)	102.5	104.7	—	—	—	—	—	—	—	—
Chile	—	1,766	1,764	—	—	19,842	16,094	16,470	62,005	50,293	51,468	123.3	120.5
Uruguay	222	336	249	—	—	—	3,366	2,213	—	10,519	6,915	—	—
*Un. of S. Afr. 13	—	246	202	90.6	109.8	1,219	1,149	934	3,810	3,589	2,917	106.1	130.6
*New Zealand	—	—	521	—	—	—	—	2,168	—	—	6,774	—	—
*New Zealand	—	54	68	—	—	—	1,042	1,168	—	3,256	3,650	—	—
TOTALS \$	75,686	78,279	78,499	96.7	96.4	856,589	895,259	781,631	2,676,840	2,797,679	2,442,591	95.7	109.6

† The years indicated are those of the harvest, single years referring to the Northern Hemisphere, double years to the Southern. — * Not included in the totals. — § In calculating totals account has been taken of the probable area cultivated in some countries for which estimates of production are available but not those of area. As the estimates for Hungary for 1939 include the areas and production of territories recently annexed by this country, the totals for Europe and the general totals for 1938 and for the average have been adjusted approximately to maintain the comparability of the series. — (1) Including Austria, Sudetenland and Memel. — (2) Average 1932-37. — (3) Average 1933-36. — (4) Area sown. — (5) Including the northern territory annexed by Hungary but excluding the Sub-Carpathian territory. — (6) Frontiers as at the end of 1937. — (7) Barley and meslin. — (8) Area provided for by the Plan. — (9) Approximate estimate. — (10) Average 1933-35. — (11) Year 1936. — (12) Area harvested. — (13) European crops only. — (14) Average 1933-34/1936-37.

Romania: By mid-December ploughing had ceased, owing to wet soil. The first snow fell at this period. Heavy snows did not come until after December 27. Fortunately, snow preceded the intense cold and sowings consequently did not suffer on the whole. On January 10 there was insufficient snow only in Băcău and Putna in Moldavia and in the Bărăgan plain in Ialomița (Lower Danube).

Owing to the contraction in the area under cereals caused by unfavourable weather the Ministry of Agriculture has taken all necessary measures to enable extensive sowings of spring cereals.

Yugoslavia The first three weeks of December were not too cold but there as mist, rain and snow in nearly all parts except Primorze. Temperatures dropped suddenly at the end of the month and, subsequently, severe frost, cold wind and heavy snowfall were recorded. Snow was heaviest at the beginning of January but continued through the first decade.

Germination and growth of winter cereals were normal and the crop is now protected by a thick snow cover.

According to unofficial reports, there has been a slight reduction in the area of winter wheat.

Argentina: According to the latest report of the Ministry of Agriculture, harvesting and threshing were well advanced in December. Results bear out the forecasts of an exceptionally low outturn.

Uruguay Wheat threshing yields are generally low or irregular. Quality is below normal, owing to damage done by the excessive rain of the spring.

India The weather in the Punjab was dry throughout December. At the beginning of January crops were in average condition in irrigated areas and under average in unirrigated areas. White ants had caused damage in Multan.

Japan The germination of winter wheat and barley took place normally.

Turkey According to the most recent estimate, production of spelt in 1939 was about 2,736,000 centals (6,840,000 bushels) against 2,560,000 (6,400,000) in 1938 and on average of 2,025,000 (5,062,000) in the five years ending 1937, percentages, 106.9 and 135.1.

Egypt. Wheat sowing was finished in Lower Egypt in the first half of December and in Upper Egypt in the second half. It was a week in advance of last year in the north of the Delta and in Upper Egypt and a week late in the south of the Delta. Manuring and irrigation were progressing, especially the latter which is usually terminated about December 25. Growth was satisfactory owing to favourable weather.

Barley sowing was finished in the middle of December. Manuring and irrigation were done on some areas before the close of the irrigation season. Growth is good.

CURRENT INFORMATION ON MAIZE.

Romania It appears probable that the Ministry of Agriculture, under the five-year agricultural plan, will advise farmers in mountainous districts to substitute potatoes for maize.

Argentina. Favoured by soil moisture reserves, maize crops were still in good condition in December.

Uruguay: The maize crop was affected by severe drought in December. Rain in the first half of January improved crop condition.

Area and Production of Maize.

COUNTRIES	† AREA					† PRODUCTION							
	1939 and 1939-40	1938 and 1939	Aver. 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40		1939 and 1939-40	1938 and 1939	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40	1938 and 1939	Average 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40	
	1939- 1940	1938- 1939	1933- 1937- 1938	1938 and 1939- 1939	Aver- age = 100	1939- 1940	1938- 1939	1933-34 to 1937-38	1939- 1940	1938- 1939	1933-34 to 1937-38	1938 and 1939- 1939	Aver- age = 100
	ooo acres					ooo centals			ooo bushels of 56 lb				
Albania . . .		230	216	...	...		3,116	2,795		5,564	4,991	...	...
Germany . ⁽¹⁾	255	347 ²⁾	202	73.4	—	...	8,369 ²⁾	4,642	...	14,944 ²⁾	8,290	...	...
* Bohemia- Moravia (Protect.) .	23	22	—	103.9	—	...	...	...	...	...	...	...	...
Bulgaria . .	1,527	1,731	1,720	88.2	88.8	...	11,735	19,756	...	20,955	35,278	...	...
* Spain . . .	1,058	...	1,075	...	98.4	...	...	16,048	...	...	28,656	...	...
France . . .	814	841	844	96.8	96.4	...	12,756	11,301	...	22,779	20,181	...	...
Greece . . .	³⁾ 683 ³⁾	671 ³⁾	625	101.9	109.3	5,766	4,398	5,663	10,296	7,853	10,112	131.1	101.8
Hungary . .	³⁾ 3,150 ³⁾	2,901 ³⁾	2,840 ³⁾	—	—	⁴⁾ 49,624 ⁴⁾	58,688 ⁴⁾	47,080 ⁴⁾	88,615 ⁴⁾	104,801 ⁴⁾	84,072	—	—
Italy . . . ⁽⁵⁾	3,185	3,297	3,220	96.6	98.9	...	58,077	58,948	...	103,710	105,265	...	...
Malta . . . ⁽⁶⁾	456	427	401	106.7	113.9	...	6,658	6,107	...	11,889	10,905	...	...
Poland . . .	0	0	0	85.7	97.1	2	3	4	4	5	7	84.0	55.7
Portugal . .	...	218	225	...	...	...	2,783	2,055	...	4,969	3,670	...	...
Romania . .	...	971	1,036	...	...	...	6,531	6,794	...	11,662	12,132	...	...
Switzerland .	12,169	12,349	12,563	98.5	96.9	129,599	112,819	110,865	231,428	201,462	197,973	114.9	116.9
Yugoslavia .	⁷⁾ 6,575 ⁷⁾	⁷⁾ 7,022 ⁷⁾	⁷⁾ 6,708	93.6	98.0	81,443	104,849	98,225	145,434	187,232	175,403	77.7	82.9
Total Europe	...	31,155	0,750	...	...	...	393,487 ⁸⁾	376,491	...	702,645	672,308	...	...
U. S. S. R. .	...	¹⁰⁾ 6,618	7,968	...	...	...	¹¹⁾ 60,811 ¹¹⁾	84,056	...	¹¹⁾ 108,592 ¹¹⁾	150,100	...	...
Canada . . .	183	180	159	101.7	115.2	4,534	4,306	3,485	8,097	7,690	6,222	105.3	130.1
U. S. A. . ⁽¹²⁾	88,803	92,222	96,176	96.3	92.3	1,466,717	1,434,830	1,156,162	2,619,137	2,562,197	2,064,575	102.2	126.9
Mexico . . . ⁽¹³⁾	(78,861)	(82,710)	(77,139)	95.3	102.2	(1321,634)	(1289,828)	(993,335)	(2360,060)	(2303,265)	(1773,813)	102.5	133.1
Mexico . . .	...	7,638	7,406	...	...	...	37,317	37,634	...	66,638	67,205	...	...
Total N. Am.	...	100,040	103,741	...	...	...	1,476,453	1,197,281	...	2,636,525	2,138,003	...	...
* China . . .	...	...	11,150	...	...	...	...	141,429	...	...	252,552	...	...
Korea . . .	...	342	302	...	...	...	2,174	2,134	...	3,882	3,811	...	...
Japan . . .	...	135	123	...	...	...	1,850	1,612	...	3,303	2,878	...	...
Manchukuo .	...	4,351	2,978	...	...	54,675	55,336	41,241	97,634	98,814	73,645	98.8	132.6
Palestine . .	...	21 ¹⁴⁾	16	...	...	...	177 ¹⁴⁾	161	...	315 ¹⁴⁾	287	...	...
Syria & Leb. .	49	48	52	101.3	95.1	...	606	538	...	1,081	961	...	...
* Transjordan .	...	...	...	...	...	...	3	3	...	6	6	...	...
Turkey . . .	...	1,171	1,071	...	...	...	13,305	11,997	...	23,759	21,423	...	...
Total Asia	...	6,068	4,542	...	...	...	73,448	57,683	...	131,154	103,005	...	...
Algeria . . .	16	15	18	104.4	85.9	...	94	106	...	168	189	...	...
Egypt . ⁽¹⁵⁾	1,606	1,545	1,614	103.3	99.1	33,720	34,449	35,071	60,214	61,516	62,627	97.4	95.8
Kenya . ⁽¹⁶⁾	...	9	7	...	...	...	178	129	...	318	230	...	...
French Morocco .	...	112	112	...	...	...	1,817	1,824	...	3,244	3,257	...	...
Anglo-Egypt. Sudan . . .	...	1,141	1,015	...	...	...	4,792	4,360	...	8,558	7,785	...	...
Tunisia . ⁽¹⁷⁾	...	26	26	...	...	...	70	236	...	124	422	...	...
Tunisia . ⁽¹⁸⁾	62	43	52	145.2	118.3	...	121	126	...	217	224	...	...
Total N. Afr.	...	2,891	2,844	...	...	...	41,521	41,852	...	74,145	74,734	...	...
Argentina {	¹⁹⁾ 17,792	¹⁹⁾ 13,097	¹⁹⁾ 16,722	135.8	106.4	...	...	...	...	...	...	...	...
Chile . . .	...	105	113	...	...	...	107,233	183,495	...	191,488	327,671	...	...
Uruguay . .	...	541	553	...	...	...	1,399	1,380	...	2,498	2,464	...	...
Madagascar .	...	...	...	...	...	...	3,498	2,938	...	6,247	5,246	...	...
Un. of . ⁽²⁰⁾	...	247	224	...	...	...	2,205	2,063	...	3,937	3,684	...	...
S. Afr. . ⁽²¹⁾	...	6,682	5,776	...	...	...	52,396	33,703	...	93,564	60,184	...	...
New Zealand	...	6	7	...	...	...	6,126	7,896	...	10,939	14,100	...	...
TOTALS . . .	...	164,737	169,476	...	...	...	2,218,723	1,989,025	...	3,962,003	3,551,832	...	...

† The years indicated are those of the harvest, single years referring to the Northern Hemisphere, double years to the Southern. — * Not included in the total. — † In calculating the totals account has been taken of the probable area cultivated in some countries for which estimates of production are available but not those of area. — (1) Including Austria and Sudetenland. — (2) Excluding Sudetenland. — (3) For the former territory of Germany the production is estimated for the years 1933 to 1936. — (4) Average 1933-35. — (5) Area sown. — (6) Including the northern territory annexed by Hungary but excluding the Sub Carpathian territory. — (7) Frontiers as at the end of 1937. — (8) Maize sown in spring. — (9) Maize sown in summer. — (10) Area provided for by the Plan. — (11) Approximate estimate. — (12) Maize for all purposes. — (13) Maize harvested as grain. — (14) Average 1933-37. — (15) Nuts maize. — (16) Soft maize. — (17) European crops only. — (18) Maize and sorghum. — (19) Area harvested. — (20) Cultivation by natives.

Netherlands Indies: Java and Madura. — The Department of Agriculture Statistics of the Central Statistical Office communicates the following details on the maize area:—

	1939 acres	1938 acres
Area harvested in October	232,000	331,400
Area harvested from January 1 to October 31 .	2,094,200	2,001,600
Area of standing crops at the end of October .	1,114,200	1,028,500
Area harvested in November	374,100	372,600
Area harvested from January 1 to November 30	4,529,300	4,519,100
Area of standing crops at the end of November	2,272,400	2,486,700

Egypt The autumn maize harvest was finished in the first days of December in Lower and Middle Egypt and at the end of the month in Upper Egypt. Preparation and storing of the crop are continuing. The first estimate shows that the yield per acre was about 5 per cent. smaller than that of last year.

Harvesting of autumn millet was finished in Middle Egypt in mid-December, harvesting of late crops was continuing in Upper Egypt. The first estimate indicates that the yield per acre is slightly below the average.

According to the first estimate, the total area cultivated to summer and autumn millet in 1939 was about 429,000 acres against 404,000 in 1938 and 321,000 on the average of the five years ending 1937; percentages, 106.0 and 133.5. The corresponding production is estimated at about 11,769,000 centals (23, 537,000 bushels) against 10,364,000 (20,728,000) and 8,647,000 (17,293,000); percentages, 113.6 and 136.1.

RICE PRODUCTION AND TRADE IN THE FAR EAST

For the three major rice-exporting countries production data for 1939-40 are at this date available only from Burma and Thailand. For Burma the third report showed a considerable setback in the area to mature as compared with the high figures of the previous two seasons and was the lowest in eight years. Destruction in the past season was mainly due to disastrous floods of the Irrawaddy and partly to bad distribution of rainfall in Upper Burma. It should be observed, however, that the high figure of matured area last season was due to an exceptionally small area being destroyed. The first estimate of production indicates an average crop, yielding 5,518,000 metric tons of white rice and derivatives. Thailand in its first forecast estimates a crop 12 per cent. above that of last season and 14 per cent. above the average of the five years ending 1937-38. Thanks to the record area cultivated and to the fact that damage this season has been only moderate, the current crop is the largest so far obtained in Thailand. For French Indochina the information so far available regarding crop prospects does not definitely swing the balance one way or the other. In Cochinchina some serious damage was reported on the Plaine des Jones but later reports indicated very favourable condition elsewhere. In Cambodia, the other exporting area, production was expected to be smaller than last season. The earlier crops in Annam were relatively small and in Tonkin large; information regarding the later crops would lead to expectations of the same tendencies in these respective countries.

On the whole, the most that can be said on the basis of the incomplete information at present available is that in the three major exporting countries conditions appear to balance out to a total approximating to the average of recent years.

Turning to the main importing countries, we find that in India, according to the second forecast, there is a decrease from last season's area under cultivation but that the figure remains higher than that of any other preceding year. The monsoon was rather a scanty one and sowing of autumn rice were reduced in Bengal and in Bihar. Sowings were delayed for the same reason in the Central Provinces while in some parts of Assam, though sowings of autumn rice were larger, they were affected by a severe drought that lasted until the end of May. The first crop in some parts of Madras was also affected by failure of rains at time of sowing. In Bombay sowing and transplanting were delayed for the same reason and crop condition suffered, particularly in Gujarat and in the south of the Deccan. In general sowings of winter rice were more fortunate. In Bengal, favoured by general rains in May and June, and in Bihar, the increases in these sowings outweighed the decreases in those of autumn rice. In Assam, on the other hand, the decrease in sowings of winter rice outweighed the increase in those of autumn rice. On the whole, according to the first forecast, areas sown were larger in Bengal, Bihar, the Central Provinces and the United Provinces, smaller in Madras, Orissa, Assam and Bombay. Flood damage occurred in Bengal, part of Orissa and in Assam. Prior to the harvest crop condition was reported to be favourable in Bengal, Bihar, Orissa and Assam, fair in Madras and less satisfactory in the United Provinces. The Central Provinces and parts of the Bombay Deccan and Gujarat, which all suffered from inadequacy of rains in the latter part of the season.

Insofar as production figures are available in the second forecast, they are what might be expected from the above conditions. Two of the leading rice-growing provinces, Bengal and Bihar, with both larger areas sown and subsequent favourable condition of the crop, production has been larger than last year. In Assam, which also registers an increase, favourable conditions of growth have apparently outweighed decreased area. In the Central Provinces unfavourable conditions have been stronger than increased area and production has decreased, as it has also in Bombay, where both areas and conditions have operated in the same direction. In the remaining provinces of major importance, Madras, Orissa and the United Provinces, the two factors have operated in opposing senses with results not yet known. In India as a whole, despite the decrease in area with respect to last season, a crop at least equal to the average of recent seasons and probably larger than last season's small crop may reasonably be expected.

According to a report of the United States agricultural attaché at Shanghai, production in China is likely to fall from 5 to 10 per cent. below the high level of last season. From the same source it is reported that stocks in the interior are large.

Rice-growing in both British Malaya and the Netherlands Indies is affected by the rise in price of rubber, to which the native growers will tend to devote

their attention rather than to food crops. This factor is likely to be a powerful one against Government efforts to increase the rice area. In the Netherlands Indies the regulation of the rice trade has been strengthened and additional measures have been adopted, in the form of laying down stocks of rice, to safe-food supplies.

Conditions in Japan have varied greatly from one district to another during the season and the resultant has been a crop differing little from that of last year and 4 per cent. above the average. Precise information from Chosen is not yet available and reports indicate a very poor crop, in consequence of drought during the past summer. While the first crop in Taiwan, which was affected by heavy rains at harvest, was 17.5 per cent. smaller than last year's and 8.1 per cent. below the average, the second crop was 2.7 per cent. above last year and 8.6 per cent. above average. The total for Taiwan is below last year's but slightly above the average. Production in Manchukuo continues to increase. The smaller supplies available from Chosen and Taiwan led to a heavier drain on stocks and the carryover in Japan on 1 November 1939 was smaller than at the same date in the previous year. Japanese troops in China, it is reported, are drawing on the supplies in the Yangtze valley, where production, however, is said to be 10 per cent. smaller than last year.

The surplus available for export from Burma in 1940 is 3,350,000 metric tons of white rice and derivatives; that for Thailand is 1,622,000 metric tons of white rice and derivatives. From non-official sources it is learnt that 1,500,000 metric tons are available for export from French Indochina. The total for the three major exporters would thus be about 6,500,000 metric tons, which is approximately the average of their actual exports in the last five years. Exports of all three countries in 1939 were very heavy. That of Burma had already before the end of December exceeded the forecast of its export surplus from the 1938-39 crop, so that it may be assumed that it had practically no carryover. Exports from Cochinchina in the past year were also maintained at levels well above the 1938 figures.

On the side of the importers, if an average production is assumed for India and reports of large supplies in China are confirmed, the existence of an average combined export surplus in the great exporting countries will enable abnormal demands from other markets to be met to a considerable extent. The smallness of Burma's exports in 1939 to countries other than India were due to the heavy demand made necessary by the poor crop in the latter country which also took the principal part in absorbing the exports of French Indochina, and probably of Thailand, which are directed in the first place principally to Singapore. This year the heaviest abnormal demand seems likely to come from Japan, as a result of the reported heavy deficit in Chosen. Trade agreements make Thailand normally the only foreign source of supply of any importance for Japan. A possible check to expansion of rice area in British Malaya, Ceylon and the Netherlands Indies, through rising prices of plantation products may lead to increased demands from these countries while the building up of emergency stocks of food will in all probability continue to absorb any supplies that may remain when current deficits are met. On the other hand, increasing

control of exports in the surplus-producing countries may be expected, while the disturbance to normal exports to European markets must also be taken into account.

CURRENT INFORMATION ON RICE.

Taiwan: In December storms did some damage to the second crop rice. Crops in the south were normal.

India: In Bengal harvesting was being completed in early January in dry weather. In Orissa rainfall in December was on the whole light to moderate, harvesting was also being completed. In Bihar, where the harvest was still in full swing at the beginning of January, the crop was in fair to good condition. Assam had seasonable weather, and crop condition on January 8 was fair.

The weather in the Central Provinces was clear and cool in December.

Madras had little rain during December, only light showers having fallen early in the month. Sowing was carried on, while standing crops were in fair condition.

Netherlands Indies: Java and Madura — The Department of Agricultural Statistics of the Central Statistical Office communicates the following details on the rice area —

	1939 acres	1938 acres
<i>Area harvested in October</i>		
Wet padi	361,000	220,600
Dry padi	2,000	2,000
<i>Area harvested from January 1 to October 31</i>		
Wet padi	8 526,200	8,438,500
Dry padi	922,700	951,400
<i>Area of standing crops at the end of November —</i>		
Wet padi	937,300	835,700
Dry padi	156,700	136,200
<i>Area harvested in November —</i>		
Wet padi	251,800	237,000
Dry padi	1,200	6,400
<i>Area harvested from January 1 to November 30.—</i>		
Wet padi	8,784,500	8,675,500
Dry padi	923,700	957,800
<i>Area of standing crops at the end of November.—</i>		
Wet padi	1,133,000	1,115,000
Dry padi	539,900	567,900

Indochina: Condition and outlook of the rice crops in November 1939. — In Tonkin the production of tenth month rice was, on the whole, fairly satisfactory and perhaps above the average. Nursery sowings for fifth month rice were finished; growth was good and preparation of fields progressed in good conditions.

In Annam the eighth month harvest was practically finished with production on the whole below average. Tenth and twelfth month crops were ripening and showed

Area and Production of Rice.

COUNTRIES	AREA					PRODUCTION OF ROUGH RICE							
	1939-40	1938-39	Average 1933-34 to 1937-38	% 1939-40		1939-40	1938-39	Average 1933-34 to 1937-38	1939-40	1938-39	Average 1933-34 to 1937-38	% 1939-40	
				1938- 1939	Aver- age							1938- 1939	Aver- age
ooo acres			= 100	= 100	ooo centals			ooo bushels of 45 lb.			= 100	= 100	
Bulgaria	20	19	18	103.9	108.9	...	421	387	...	936	860	...	...
Greece . .	¹⁾ 6 ¹⁾	8 ¹⁾	3	77.8	189.1	¹⁾ 102	209	47	227	464	103	49.0	219.7
Italy . .	366	367	344	99.8	106.5	¹⁾ 18,043	15,984	¹⁾ 15,984	¹⁾ 29	40,094	35,519	...	...
Romania	1	1	—	117.0	—	13	...	—	29	...	—	...	—
United States	1,039	1,076	899	96.6	115.5	23,538	23,628	19,741	52,306	52,506	43,868	99.6	119.2
Burma	¹⁾ 12,108	12,532	12,343	96.6	98.1	¹⁾ 163,726	180,096	161,233	¹⁾ 363,836	400,213	358,295	90.9	101.5
French Indo China:													
Annam (first semester)	1,075	1,180	1,021	91.1	105.4	8,003	8,199	8,531	17,784	18,220	18,958	97.6	93.8
Tonkin (5th month)	...	1,205	1,186	...	...	14,897	14,727	13,216	33,103	32,726	29,368	101.2	112.7
India ⁴⁾	¹⁾ 69,301	¹⁾ 70,158	¹⁾ 67,850	98.8	102.1	...	...	...	...	...	...	...	...
Japan	7,815	7,893	7,828	99.0	99.8	267,109	269,518	256,785	593,564	598,918	570,622	99.1	104.0
Manchukuo .	...	862	597	...	...	19,196	15,530	10,011	42,657	34,511	22,246	123.6	191.8
Taiwan	...	1,545	1,643	...	...	37,221	40,168	37,031	82,712	89,260	82,289	92.7	100.5
Thailand ⁴⁾	7,881	7,731	6,962	101.9	113.2	112,054	99,730	98,186	249,004	221,618	218,186	112.4	114.1
Egypt:	568	495	419	114.8	135.5	19,449	15,988	12,427	43,218	35,528	27,615	121.6	156.5

(1) Area sown — (2) Production in 1939-40 is officially estimated at over 17,000,000 centals or 14,200,000 bushels — (3) Third report — (4) Second report — (5) First forecast

even growth. Preparation for third month's crops was progressing, the seedlings and nurseries of *mas* looking well. Transplanting of first and second months continued; preparation of fields went forward at a good pace and growth was good.

In Cochinchina, copious and well-distributed rain at the end of September favoured growth of newly transplanted season rice in the central provinces where harvesting was almost finished. In the east, the mid-season crops looked well, harvesting continued. Rice which did not suffer from floods in the west in September looked well and a good crop was expected. Conditions were favourable for after-flood rice; *mas* were growing vigorously.

In Cambodia, rice fields had sufficient water in October. The last replantings were effected in good conditions. The area under rice this year is about equal to last year. Production, however, will be smaller.

Egypt: Harvesting of autumn rice was finished in mid-December. The yield per acre is above the average.

CURRENT INFORMATION ON POTATOES.

Greece: The weather in November was on the whole favourable for the growth and harvesting of potatoes; harvesting was completed in the North, while it was still continuing in the second half of the month in the remainder of the country and the Islands. On the whole, crop forecasts are satisfactory in a number of re

Area and Production of Potatoes.

COUNTRIES	AREA					PRODUCTION						
	1939	1938	Average	1939	% and	1939	1938	Average	1939	1938	Average	1939
	and	and	1933	to 1937		and	and	1933	and	and	1933	and
	1939-40	1938-39	1933-34	1937-38	1939-40	1939-40	1938-39	1933-34	1938-39	1933-34	1938-39	1939-40
	ooo acres					ooo centals			ooo bushels of 60 lb			
Albania . . .	...	...	0	...	...	...	...	34	...	57	...	...
Germany ^(s)	388	428	...	90.7	100.9	38,361	44,754	118,409	63,933	74,558	186,397	85.7
Belgium ^(t)	7,460	7,618	7,777	97.9	...	120,240	1,198,878	71,836	200,396	1,998,090	119,725	100.3
Bohemia- Moravia ^(s)	363	364	398	99.7	91.4	...	...	...	...	...	...	...
(Protecto- rate) ^(t)	40	39	—	102.5	—	...	...	...	...	...	...	...
Bulgaria . .	828	821	—	100.8	—	...	...	...	...	...	...	...
Denmark . .	49	49	40	99.0	122.4	...	1,401	2,384	...	2,334	3,974	...
Spain . . .	168	196	190	85.9	88.5	24,912	31,586	28,793	41,520	52,642	47,988	78.9
Estonia . .	1,006	...	1,127	...	89.3	...	...	110,723	...	...	184,534	...
Finland . .	221	193	180	114.7	123.2	19,061	21,994	20,944	31,768	36,656	34,906	86.7
France . . .	219	211	208	103.9	105.6	34,304	26,409	28,707	57,172	44,014	47,844	129.9
Greece . . .	3,415	3,521	3,496	97.0	97.7	...	381,721	339,176	...	636,189	565,281	...
Hungary . .	56	53	49	105.4	113.6	3,591	3,153	2,857	5,895	5,254	4,761	113.9
Ireland . . .	778	720	720	—	—	52,131	47,193	45,758	86,883	78,653	76,261	...
Italy . . .	327	336	...	...	...	...	55,123	57,103	...	91,872	95,172	...
Latvia . . .	83	84	73	98.6	113.1	7,240	8,015	5,826	12,066	13,358	9,710	90.3
Lithuania .	959	956	971	100.3	98.8	...	57,000	54,251	...	94,998	90,417	...
Luxemburg .	359	340	288	105.5	124.7	36,525	38,611	33,964	60,873	64,350	56,606	94.6
Malta . . .	437	460	444	95.1	98.4	46,377	46,699	47,013	77,294	77,830	78,354	99.3
Norway . .	43	43	41	99.8	103.5	5,776	6,296	3,982	9,626	10,492	6,636	91.7
Netherlands: for con- sumption .	9	9	8	98.4	102.8	693	629	560	1,156	1,049	933	110.2
for starch	132	124	...	...	...	20,743	20,671	19,842	34,571	34,452	33,070	100.3
Poland . . .	237	224	287	105.6	82.4	66,139	43,509	40,679	110,229	72,513	77,788	106.4
Portugal . .	71	76	61	93.5	116.1	...	18,672	14,219	...	31,119	23,697	...
Romania . .	7,562	7,487	7,039	101.0	107.4	...	761,881	744,303	...	1,269,777	1,240,480	...
single crop. with maize	...	77	80	...	...	...	13,068	12,353	...	21,779	20,587	...
United King- dom . . .	512	476	515	107.6	99.5	39,992	36,695	39,902	66,652	61,157	66,503	109.0
England & Wales . .	...	226	226	...	...	...	3,027	3,373	...	5,046	5,621	...
Scotland . .	454	475	476	95.6	95.3	74,189	78,086	70,497	123,648	130,144	117,495	95.0
Northern Ireland . .	134	135	139	99.4	96.7	...	20,563	21,952	...	34,272	36,587	...
Sweden . .	115	123	133	93.2	86.8	...	15,935	19,761	...	26,558	32,934	...
Switzerland .	336	338	327	99.4	103.0	41,189	41,283	41,708	68,648	68,803	69,513	99.8
Yugoslavia ^(s) via ^(t)	125	123	116	101.2	107.2	14,683	17,882	16,760	24,471	29,802	27,933	82.1
U. S. S. R. .	...	658	635	...	...	...	37,515	34,534	...	62,524	57,556	...
Canada . . .	...	16,578	16,875	...	...	...	925,063	1,266,119	...	1,541,740	2,110,156	...
United States	518	522	527	99.2	98.2	35,320	35,938	42,334	58,867	59,897	70,557	98.3
Mexico . . .	3,032	3,023	3,359	100.3	90.3	216,595	224,497	223,440	360,992	374,163	372,401	96.5
Cyprus . . .	...	40	32	...	...	...	1,575	1,387	...	2,624	2,311	...
Japan . . .	...	6	6	...	...	504	504	479	840	840	799	100.0
Palestine . .	...	396	358	...	...	...	40,743	33,672	...	67,904	56,119	105.2
Syria and Le- banon . .	...	2	2	...	...	...	193	89	...	322	148	...
Turkey . . .	...	19	18	...	...	...	918	885	...	1,530	1,475	...
Algeria . . .	...	134	127	...	...	...	3,717	3,514	...	6,194	5,857	...
Egypt . . .	22	17	17	125.7	131.1	1,370	1,470	995	2,284	2,450	1,658	93.2
Tunisia . . .	26	26	23	100.5	111.6	...	734	1,389	...	2,890	2,315	...
Argentina . .	...	10	8	...	...	...	1,742	814	...	1,570	1,356	...
Chile . . .	7	7	5	100.0	147.1	...	121	152	...	202	254	...
Union of South Africa	...	309	296	...	...	...	15,704	14,728	...	26,172	24,546	...
New Zealand	...	134	126	...	...	...	10,728	10,142	...	17,879	16,903	...
	...	...	84	...	...	...	3,811	3,744	...	6,352	6,240	...
	...	18	23	...	...	...	1,964	2,842	...	3,273	4,736	...

(s) Early potatoes. — (t) Late potatoes. — (i) Including Ostmark and Sudetenland. — (2) Average 1932 to 1937. — (3) Average 1933-1935. — (4) Including the northern region annexed by Hungary, but not including Sub-Carpathian Russia. — (5) Territory at the end of 1937. — (6) Average 1935 to 1937. — (7) Area provided for by the Plan.

gions. The first half of December was rather mild, variable and not very wet, which was favourable for lifting, but the latter was hampered in the second half of December by heavy rain and snow.

Romania: See Maize.

Argentina. Potato prospects in 1939-40 are mediocre to average, excessive rain and late frosts having affected the crops.

SUGAR PRICES AND MARKET PROSPECTS.

Before making the usual annual review of the principal sugar markets, it may be observed that, in 1939, variations in prices were in most cases confined within narrow limits as the quantity of sugar available was always sufficient. In New York during the last two months of 1938, sugar quotations showed a downward trend owing to the scarcity of business and the depressing effects of the publication of total quantities admitted for consumption in 1939 at a larger figure than was expected in market circles. There was practically no change in prices up to the middle of March 1939, mainly owing to the absence of business but also to other causes, for example, a proposal for a reduction in the duty in favour of Cuban sugar. Subsequently, until the end of May, prices, though still moving within narrow limits, were a little firmer owing to an appreciable increase in purchases for export. From the beginning of June to the end of August, fluctuations became more pronounced with a tendency to reduction. At the end of the month, threatening information from Europe and rumours of war did not have much effect on the American market, but on the declaration of war the market reacted immediately and quotations rose 95 points in the first week of September but with little increase in the volume of business done. The speculative movement was arrested immediately when the Government on September 11 suspended all restrictions on imports and on the quantities available for sale in force under the Sugar Act of 1937. This provision prevented the cornering of a commodity the supplies of which had become almost inexhaustible and quotations gradually fell to the lowest levels of the year in the first half of November. The steps taken by the United Kingdom to purchase the entire output of its colonies and dominions, by which this country partially withdrew from the American market, contributed to this result.

Meanwhile, market circles, preoccupied by what was considered the excessive decline in sugar prices, exercised pressure on the Government to abrogate the proclamation of September 11 and to reintroduce the quota system. On December 26 the Government withdrew the proclamation which had fulfilled its object of limiting speculation, and reintroduced the import quotas and the quantities admitted for internal consumption. Meanwhile, in anticipation of this measure, sugar quotations rose gradually and, at the end of 1939, showed an increase of 47 points on the minima of early November. On the whole, the quotations of the American market in 1939 did not vary widely except at the beginning of the war, after which they declined up to the end of year.

Sugar Prices.

DATE		New York	London		Prague	Paris	Magdeburg
		Cuba centrifugals 96° c. & f. cents per lb.	Cane centrifugals 96° c. i. f sh. per 112 lb.	Granulated duty free sh. per 112 lb.	Raw sugar 88° spot crowns per 100 kg.	No. 3 Crystallized frs. per 100 kg.	Refined — Marks per 50 kg.
January	5, 1939	1.90	6/3	20/6 ³ / ₄	66.75	326.75	31.47
"	12, "	1.90	6/3 ³ / ₄	20/6 ³ / ₄	66.37	328.00	31.35
"	19, "	1.90	6/3	20/6 ³ / ₄	66.75	328.00	31.47
"	26, "	1.92	6/3 ³ / ₄	20/6 ³ / ₄	66.75	327.00	31.35
February	2, "	1.92	6/3	20/6 ³ / ₄	66.75	333.25	31.50
"	9, "	1.90	6/2 ¹ / ₄	20/6 ³ / ₄	66.75	334.00	31.47
"	16, "	1.90	6/1 ¹ / ₂	20/6 ³ / ₄	66.00	334.50	31.45
"	23, "	1.90	6/1 ¹ / ₂	20/5 ¹ / ₄	66.25	338.25	31.35
March	2, "	1.95	6/2 ¹ / ₄	20/3 ³ / ₄	67.75	339.75	31.35
"	9, "	1.90	6/3 ³ / ₄	20/5 ¹ / ₄	69.75	341.00	31.47
"	16, "	1.95	6/3 ³ / ₄	20/3 ³ / ₄	67.25	341.25	31.47
"	23, "	2.00	6/6	20/6 ³ / ₄	67.75	346.50	31.50
"	30, "	2.00	6/6	20/6 ³ / ₄	69.25	344.75	31.47
April	6, "	2.00	6/6 ³ / ₄	20/8 ¹ / ₄	69.75	348.75	31.35
"	13, "	1.98	6/9	20/9 ³ / ₄	74.00	349.25	31.35
"	20, "	2.05	7/3	21/0 ³ / ₄	78.50	348.75	—
"	27, "	2.03	7/10 ¹ / ₂	23/11 ¹ / ₂	n. q.	350.50	31.35
May	4, "	2.03	8/4 ¹ / ₂	24/9 ³ / ₄	76.50	361.00	31.47
"	11, "	2.05	8/4 ¹ / ₄	24/9 ³ / ₄	76.50	361.50	31.47
"	18, "	2.00	8/0	24/9 ³ / ₄	76.50	—	—
"	25, "	2.00	8/0	24/6 ³ / ₄	74.50	350.25	31.35
June	1, "	2.00	7/9	24/3 ¹ / ₄	74.50	344.25	31.35
"	8, "	1.97	7/4 ¹ / ₄	24/0 ³ / ₄	79.00	339.00	31.50
"	15, "	1.90	7/3	24/0 ³ / ₄	80.50	336.00	31.42
"	22, "	1.95	7/9	24/8 ¹ / ₄	80.50	337.50	31.46
"	29, "	2.00	8/3	—	83.00	333.50	31.47
July	6, "	2.03	8/0	24/11 ¹ / ₄	85.50	346.25	31.35
"	13, "	1.95	7/6	24/7 ¹ / ₂	88.50	348.25	31.47
"	20, "	1.95	7/1 ¹ / ₂	24/1 ¹ / ₂	89.00	349.00	31.46
"	27, "	2.00	7/0	23/9	87.50	348.00	31.35
August	3, "	2.00	6/9	23/5 ¹ / ₄	85.50	344.50	31.47
"	10, "	1.90	6/6	23/5 ¹ / ₄	85.75	339.50	31.35
"	17, "	1.93	6/3 ³ / ₄	23/0	85.50	339.00	31.47
"	24, "	1.90	6/9	23/2 ¹ / ₄	86.50	341.00	31.35
"	31, "	2.00	6/6	23/5 ¹ / ₂	86.00	—	—
September	7, "	2.95	—	—	—	—	31.40
"	14, "	2.20	—	—	100.00	—	31.45
"	21, "	2.10	—	—	170.00	—	31.45
"	28, "	2.15	—	—	175.00	—	31.35
October	5, "	2.17	—	—	167.50	—	31.45
"	12, "	2.17	—	—	170.00	—	31.45
"	19, "	1.90	—	—	170.00	—	31.45
"	26, "	1.75	—	—	169.00	—	31.45
November	2, "	1.45	—	—	170.00	—	31.40
"	9, "	1.45	—	—	171.00	—	31.46
"	16, "	1.80	—	—	173.00	—	31.40
"	23, "	1.80	—	—	173.00	—	31.40
"	30, "	1.70	—	—	173.00	—	31.40
December	7, "	1.70	—	—	173.00	—	31.40
"	14, "	1.70	—	—	n. 175.00	—	31.40
"	21, "	1.86	—	—	173.00	—	31.40
"	28, "	1.92	—	—	173.00	—	31.45

1) For October delivery.

On the London market the highest quotations of the year were reached at the end of 1938. At the beginning of 1939 quotations were maintained for some time, despite the limited volume of business, which led to a slight weakening at the end of February. In the first days of March prices again went up, partly in sympathy with the American movement, but mainly owing to the troubled European situation and the low supplies of beet-sugar. This movement con-

tinued until in May the highest prices of 1939 were reached. They then weakened but not seriously, in anticipation of the decision of the International Sugar Council, which was considering an increase in the export quotas of the member countries of about 5,300,000 centals (260,000 short tons). There was a slight recovery in the first days of July owing to an increased demand for refined sugar followed by another decline, prices then remaining at a low level up to the end of August in the almost entire absence of trading owing to the gravity of the political situation. Quotations were thus almost nominal and continued so until the closing of the market on September 4.

The sugar market in Prague was not influenced for throughout 1939 by the great world markets, as it was in the previous year. In January and February there was little movement and only a small volume of business. Sugar circles took the view that the season's beet sowings would not exceed 90 per cent. of those of the preceding year. In the middle of March the market was completely lifeless for some days owing to the decisive political changes then taking place, though inquiries for sugar from the selling markets continued. Sales then took their normal course and prices gradually rose with brief fluctuations up to the end of July as the supplies of the refineries contracted. In August there was a slight weakening in prices owing to the reduction in business caused by the political tension of this period, though the supply situation was not changed.

After the outbreak of hostilities and the cessation of British exports, buyers who previously obtained sugar in the United Kingdom turned to the Prague market, especially in the first week, causing a notable increase in prices, which then began a steep rise which had not ended at the close of the year.

The sugar market of Paris was moderately active at the beginning of 1939 and prices were rather high, owing mainly to the reduced production of France in 1938-39. For the same reason quotations continued to rise up to mid-May, being supported also by other factors such as the increased consumption compared with the corresponding period of 1938, the increase in the import duty, and the political events of March. In June, July and August, the course of the Parisian market was variable with no clearly defined character, but with a general downward tendency in sympathy with other markets, until the closing of the market at the commencement of hostilities and the Decree of September 9 by which the price of white crystallized sugar for the year 1939-40 was fixed at 312 francs per quintal.

On the Magdeburg market, where prices are controlled by the *Hauptvereinigung der deutschen Zuckerwirtschaft*, quotations ranged from a minimum of RM 31.35 to a maximum of RM 31.50 in 1939.

In contrast with last year, prices in Soerabaya have not been given, since the quotations in the list do not correspond with those fixed by the Nivas for each contract, these prices varying considerably, even on the same day, according to the purchasing country.

The world sugar market in 1939 was generally quiet, because of the large supplies available, and the plentiful production of the year did not give rise to abnormal purchases.

It may be useful to say something on the effects of the war on the sugar market. As some European countries are now at war and as it is impossible to forecast the duration and scope of the conflict, it is feared or hoped, according to the interests at stake, that sugar prices may reach the high levels recorded during the last world war and the immediate post-war period. Actually, no confident forecasts can be made, but it may be useful to attempt to compare the conditions of sugar production during the Great War with those of to-day. For this purpose the following table shows the sugar production of four periods, each with its own character, namely, the average production of the five years preceding the world war, a period of general peace, the average production of the five years, including totally or partially the production of the years of the Great War, the average of the three years following the War when the European production of sugar, in the dislocated and difficult conditions, reached its lowest level, and finally the average production of the five years preceding the present conflict, obtained in a period of doubtful peace. The percentages of the total represented by the various countries are indicated alongside the quantitative figures.

The salient feature in the table is the fall in European production during the War and in the immediate postwar period. During the War, production fell to two-thirds and in the following three years to less than half of the prewar level. America, especially North America, rapidly supplied the deficiency and met all European requirements, imposing naturally its own prices, which touched levels never reached after 1920 and which determined also those of Europe.

In the competition, Cuba stood out, doubling in a few years its large pre-war production. The United States, Puerto Rico, the Dominican Republic, Brazil and Peru followed but at a great distance. Java and the Philippines also increased their production but the increases in other continents were limited.

The figures of the last five years show that production increased considerably in all continents as compared with the period before the last war. Europe increased its production by 30 million centals (1.5 million short tons), North and Central America by 55 (2.8) million. South America by 36 (1.8) million, Asia by 72 (3.6) million, Africa by 14 (0.6) million and Oceania by 23 (1.1) million; the total increase was 230 (11.5) millions.

The percentage of the total represented by European production is inferior to that of the average of 1909-10 to 1913-14, since the increase in this continent was proportionately smaller than that of world production, but the quantity of sugar available now in Europe is greater than that which was available before the last war. The increase in European production is also larger, though the proportionate increase is much smaller than that of other continents, than the increase in the population. For the whole world, while population has increased between the two wars by 25 per cent., the available supplies of sugar have increased in the same period by 63 per cent.

Average Production of Sugar

COUNTRIES	Average 1909-10 to 1913-14	Per- centage of total	Average 1914-15 to 1918-19	Per- centage of total	Average 1919-20 to 1921-22	Per- centage of total	Average 1934-35 to 1938-39	Per- centage of total
	000 cents	%	000 cents	%	000 cents	%	000 cents	%
EUROPE.								
Germany	50,914	13.9	37,267	10.1	22,681	6.3	45,098	7.6
Austria	23,396	6.4	17,353	4.7	265	0.1		
Belgium	5,721	1.6	2,881	0.8	5,587	1.5	5,174	0.9
Bulgaria	73	0.02	260	0.1	256	0.1	353	0.1
Denmark	2,542	0.7	2,956	0.8	3,155	0.9	4,222	0.7
Spain	2,657	0.7	2,886	0.8	3,541	1.0	4,822	0.8
Finland	—	—	—	—	24	0.01	251	0.04
France	16,158	4.4	4,385	1.2	6,221	1.7	21,350	3.6
Hungary	9,998	2.7	2,725	0.7	776	0.2	2,729	0.5
Ireland	—	—	—	—	—	—	1,817	0.3
Italy	4,173	1.2	2,851	0.8	3,664	1.0	7,826	1.3
Latvia	—	—	—	—	—	—	1,043	0.2
Netherlands	4,927	1.4	5,053	1.3	6,345	1.8	5,002	0.8
Poland	—	—	—	—	3,292	0.9	10,829	1.8
Romania	750	0.2	692	0.2	384	0.1	2,624	0.4
United Kingdom	—	—	—	—	—	—	11,301	1.9
Sweden	3,071	0.8	2,987	0.8	3,997	1.1	6,632	1.1
Switzerland	60	0.02	249	0.1	86	0.02	229	0.04
Czechoslovakia	—	—	—	—	13,874	3.8	14,196	2.4
Yugoslavia	194	0.1	22	0.01	445	0.1	1,662	0.3
U. S. S. R.	36,586	10.0	27,992	7.6	1,671	0.5	44,683	7.5
<i>Total</i>	<i>161,220</i>	<i>44.1</i>	<i>110,559</i>	<i>30.0</i>	<i>76,264</i>	<i>21.1</i>	<i>191,843</i>	<i>32.2</i>
NORTH AND CENTRAL AMERICA								
Cuba	46,321	12.6	72,464	19.6	87,352	24.2	60,266	10.1
Canada	254	0.1	234	0.1	681	0.2	1,486	0.2
United States	19,992	5.5	22,829	6.1	25,666	7.1	36,720	6.2
Mexico	3,267	0.9	1,704	0.5	2,330	0.6	6,762	1.1
Puerto Rico	7,269	2.0	8,772	2.4	9,246	2.6	17,866	3.0
Dominican Republic	2,092	0.6	3,001	0.8	3,477	1.0	9,334	1.6
Other countries	8,358	2.2	9,482	2.6	9,330	2.6	10,805	1.8
<i>Total</i>	<i>87,553</i>	<i>23.9</i>	<i>118,486</i>	<i>32.1</i>	<i>138,082</i>	<i>38.3</i>	<i>143,239</i>	<i>24.0</i>
SOUTH AMERICA								
Argentina	3,878	1.1	3,455	0.9	5,196	1.4	8,830	1.5
Brazil	6,169	1.7	8,468	2.4	15,446	4.3	23,451	3.9
Peru	4,052	1.1	6,036	1.6	7,842	2.2	8,545	1.4
Other countries	26	0.01	26	0.01	79	0.02	9,442	1.6
<i>Total</i>	<i>14,125</i>	<i>3.9</i>	<i>17,985</i>	<i>4.9</i>	<i>28,563</i>	<i>7.9</i>	<i>50,268</i>	<i>8.4</i>
ASIA.								
Japan and Taiwan	5,260	1.5	9,275	2.5	7,736	2.2	27,199	4.6
India	31,795	8.7	36,928	10.0	36,544	10.1	72,629	12.2
Java	29,705	8.1	35,252	9.6	33,550	9.3	23,867	4.0
Philippines	8,166	2.2	8,455	2.3	9,976	2.8	21,140	3.5
Other countries	611	0.2	1,118	0.3	448	0.1	2,888	0.5
<i>Total</i>	<i>75,537</i>	<i>20.7</i>	<i>91,028</i>	<i>24.7</i>	<i>88,254</i>	<i>24.5</i>	<i>147,723</i>	<i>24.8</i>
AFRICA								
	9,412	2.6	11,188	3.0	11,852	3.3	22,829	3.8
OCEANIA								
Australia	4,348	1.2	5,084	1.4	4,923	1.4	16,693	2.8
Hawaii	11,380	3.1	12,242	3.3	11,129	3.1	19,063	3.2
Fiji Islands	1,693	0.5	2,108	0.6	1,527	0.4	3,012	0.5
Other countries	—	—	—	—	—	—	1,431	0.3
<i>Total</i>	<i>17,421</i>	<i>4.8</i>	<i>19,434</i>	<i>5.3</i>	<i>17,639</i>	<i>4.9</i>	<i>40,199</i>	<i>6.8</i>
GENERAL TOTALS	365,268	100.0	368,680	100.0	360,654	100.0	596,101	100.0

There is thus one substantial difference between the general European sugar situation at the beginning of the Great War and the beginning of the present war

Another important element is the comparison between initial sugar stocks in the two periods considered but this comparison cannot be made, owing to the

*Average Population and Sugar Production in the years 1909-10/1913-14
and 1934-35/1938-39*

	Europe (1)	North and Central America	South America	Asia (2)	Africa	Oceania	Total (2)
Population before the Great War in 000's	497 000	133 500	56,470	515 000	134,230	7 660	1,344,000
Population before the present war in 000's	566 920	179 880	89 800	682 000	153 300	10,400	1 682,000
<i>Percentage increase</i>	<i>14.1</i>	<i>34.7</i>	<i>59.0</i>	<i>32.4</i>	<i>14.2</i>	<i>35.8</i>	<i>25.2</i>
Average sugar production before the Great War in thousand <i>centals</i>	161 218	87,552	14,125	75 537	9 412	17 421	365,265
Average sugar production before the present war in thousand <i>centals</i>	191,842	143,239	50,268	147,723	22 829	43 199	596 100
Average sugar production before the Great War in thousand <i>short tons</i>	8 061	4,378	706	3 777	471	871	18,264
Average sugar production before the Great War in thousand <i>short tons</i>	9,592	7,162	2,513	7,386	1 141	2 010	29,804
<i>Percentage increase</i>	<i>19.0</i>	<i>63.6</i>	<i>255.9</i>	<i>95.6</i>	<i>142.6</i>	<i>130.8</i>	<i>63.2</i>

(1) Including U. S. S. R. - (2) Not including China

absence of indications for August 1914, when statistics were rather incomplete, and of many figures for September 1939, many countries having now suspended the publication of economic statistics. It may, however, be said that the present reserves of sugar are much larger than they were in 1914. The specialist reviews and journals of the earlier period wrote that if the war lasted beyond the autumn, that is to say, three or four months, "the deficiency could not be made up" or "there would be a scarcity which would remain indelibly in the memories of this generation" or "the stocks will be absolutely inadequate". To-day no such statements can be made. The stocks of September 1939, which have been communicated by some countries and which have been published in the November number of the Crop Report, are a proof of the existence of considerable stocks and do not allow for the large stocks which the Governments of European countries have accumulated as a precautionary measure, independently of the commercial stocks. These figures have not been revealed but they are surely large.

It must be remembered also that industrial equipment to-day is far superior to that of 26 years ago, and will make it possible to increase sugar production, especially in the cane-growing countries in a relatively short time. Finally, the

Great War came unexpectedly and surprised all nations involved in it, while the present war has come after a period of several years during which it has been felt to be imminent; many Governments had thus taken measures to assure labour supplies for cultivation and manufacture and had introduced restrictions on consumption at the outset of the war in addition to providing large stocks. Another factor to note is that governments to a much greater than heretofore reserve to themselves the right of fixing market prices in order to render more uncertain the advantage of cornering of large sugar stocks. It does not appear probable therefore that a speculative movement in sugar similar in dimensions to that experienced during and after the last war will be repeated on this occasion.

Production of Beet-Sugar (raw).

COUNTRIES	PRODUCTION (1 Sept. - 31 Dec)		TOTAL PRODUCTION DURING THE SEASON			% 1939-40	
	1939-40	1938-39	1939-40 (1)	1938-39	Average 1933-34 to 1937-38	1938-39	Average
						= 100	= 100
			thousand centals				
Germany . . . . .	...	...	57,320	46,959	42,760	122	134
Bohemia-Moravia . . . . .	...	...	10,832	11,585	14,167	103	85
Slovakia . . . . .	...	...	1,157				
Belgium . . . . .	...	...	5,953	4,237	5,400	140	110
Bulgaria . . . . .	...	...	772	476	441	162	175
Denmark . . . . .	...	...	5,071	4,026	4,491	126	113
Spain . . . . .	...	...	2,447	1,984	5,051	123	48
Finland	3) 309	3) 248	331	337	213	98	155
France . . . . .	...	...	22,779	18,426	21,836	124	104
Hungary	3) 2,868	3) 2,440	2,870	2,807	2,765	102	104
Ireland	1,395	1,163	1,396	1,334	1,705	105	82
Italy . . . . .	...	...	10,296	8,768	7,415	117	139
Latvia . . . . .	...	...	882	816	1,024	108	86
Lithuania . . . . .	...	...	600	458	447	131	134
Netherlands	3) 4,469	3) 4,167	5,181	4,521	5,323	115	97
Poland . . . . .	...	...	9,480	12,037	9,933	79	95
Romania	3) 2,565	3) 2,748	3,748	3,682	2,444	102	153
United Kingdom . . . . .	...	...	12,103	7,407	12,036	163	101
Sweden . . . . .	...	...	6,746	6,446	6,687	105	101
Switzerland . . . . .	...	...	326	287	212	114	134
Yugoslavia . . . . .	...	...	2,822	1,896	1,612	149	175
Total Europe (a) . . . . .	...	...	163,112	138,489	145,962	118	112
U. S. S. R.	3) 24,773	...	52,911	48,502	39,431	109	134
Total Europe (b) . . . . .	...	...	216,023	186,991	185,393	116	117
Canada	—	—	...	1,631	1,459	...	...
United States	—	—	34,390	36,059	28,158	95	122
Total North America	—	—	34,390	36,059	28,158	95	122
Japan	—	—	1,135	1,096	873	104	130
Manchukuo	—	—	...	463	129	...	...
Turkey	—	—	2,205	1,042	1,449	212	152
Total Asia	—	—	3,340	2,138	2,322	156	144
GENERAL TOTALS	(a) —	—	200,842	176,686	176,442	114	114
	(b) —	—	253,753	225,188	215,873	113	119

(a) Not including U. S. S. R. — (b) Including U. S. S. R. — (1) Approximate data. — (2) Licht's estimate. — (3) Production to the end of November.

The beet sugar production of Canada and Manchukuo is not yet known but, with the estimates of production in the United States, U. S. S. R., Japan and Turkey, it is possible to construct a total representing practically the entire world production of beet sugar. This total for the year 1939-40 is 13 per cent. larger than that of 1938-39 and 18 per cent. above the average of the five years 1933-34 to 1937-38. This substantial increase is due to results in Europe which offset the decrease in American production. If the production of the U. S. S. R. proves to be larger than the estimate given in the table, as may be expected, to judge from the Soviet press, the increase in production over previous years will be still more marked.

E. R.

CURRENT INFORMATION ON SUGAR.

France: At the middle of December sugar-beet lifting was still in progress in the north and northeast. In spite of considerable difficulties beet harvesting was proceeding regularly. On January 10 there were still large quantities of beet ready for carting alongside the roads and it was forecast that the sugar manufacturing season would be prolonged. Great efforts were being made to lift beet still in the ground at the time of the snow fall about the middle of January. In any case, the harvest is very large. (*Journal du Commerce*, Paris).

Italy According to unofficial reports, the results of the 1939 season were as follows: area declared as intended for cultivation 372,000 acres, against 358,000 in 1938; area actually cultivated 347,000 acres; beet delivered for sugar and alcohol manufacture 74,369,000 centals (3,718,000 short tons). The Commission for Autarchy had stated in October, 1938 that the area necessary to produce sufficient sugar and alcohol to supply the requirement of Italy was 408,000 acres. The average sugar content during the season was 10.5 per cent. against 15.9 per cent in the previous season.

The programme for the 1940-41 season provides for an area under beet of 445,000 acres, a sugar production of 9,900,000 centals (495,000 short tons) and an alcohol production of 700,000 hectanhydres.

Antigua: It was reported in November that the condition of the canes had improved by great strides after the recent rains.

Argentina: The beet crops in the main producing areas were in good condition in December.

Cane crops were in good condition everywhere in December. An increase in the cultivated area is expected in the north of the province of Corrientes.

Barbados: Weather conditions during October were much more satisfactory than at any other period during the year; there were several heavy showers well distributed over the island. As a result, the sugar cane was reported to have decidedly improved. It was expected that, provided the weather conditions continued favourable during

the remainder of the growing season, a crop equivalent to between 100,000 and 110,000 long tons (2,250,000-2,500,000 centals or 110,000-120,000 short tons) of sugar should be reaped in 1940.

St. Lucia: It was reported in November that the canes had benefited enormously from the regular rains recently experienced, and yield prospects were generally good. Planting of the new crop had commenced and the preparation of land for this purpose continued.

Area and Production of Sugar-Beet.

COUNTRIES	AREA					PRODUCTION							
	1939	1938	Average 1933 to 1937	% 1939		1939	1938	Average 1933 to 1937	1939	1938	Average 1933 to 1937	% 1939	
				1938	Average = 100							1938	Average = 100
ooo acres					ooo centals			ooo short tons					
Germany (1) .	1,404	1,394	1,037	100.7	135.6	383,385	379,196	274,476	19,169	18,960	(2)13,724	101.1	139.7
Belgium .	134	122	126	109.6	106.2	...	26,492	33,546	...	1,325	1,677	..	...
Bohemia- Moravia (Protect.) .	289	287	—	100.5	—	—	—	—	—	—	—	—	—
Bulgaria . .	29	29	18	99.4	158.3	—	2,834	3,346	—	142	167	—	—
Denmark (3) .	95	94	101	100.8	93.8	35,054	30,049	35,188	1,753	1,502	1,759	116.7	99.6
Finland (4) .	14	13	7	112.9	193.7	...	2,885	1,750	...	144	87	...	...
France (5) .	(6) 824	787	784	104.3	105.0	...	176,037	195,304	...	8,802	9,765	...	...
Hungary .	(7) 130	(8) 109	(8) 114	—	—	(7)23,840	(8)21,372	(8)21,043	(7) 1,192	(8) 1,069	(8) 1,052	—	—
Ireland . . .	...	51	48	...	...	...	9,329	11,172	...	466	559	...	...
Italy	368	336	256	109.8	144.0	...	71,723	58,499	...	3,586	2,925	...	...
Latvia . . .	...	34	34	...	...	...	5,085	5,916	...	255	296	...	...
Lithuania .	...	20	15	...	...	...	3,166	2,819	...	158	141	...	...
Netherlands .	113	108	106	105.1	106.1	37,258	33,499	37,393	1,863	1,675	1,870	111.2	99.6
Poland . . .	...	372	296	...	...	...	69,720	56,087	...	3,846	2,804	...	...
Romania . .	131	117	87	112.0	151.2	17,042	16,116	12,689	852	806	635	105.8	134.3
Unit. King.: Engl. and W. Scotland . .	337	329	356	102.5	94.6	..	47,936	74,238	...	2,397	3,712	...	...
Sweden . . .	7	7	6	101.5	121.9	...	1,411	1,297	...	71	65	...	...
Switzerland .	125	125	128	100.0	98.2	41,885	40,430	41,638	2,094	2,021	2,082	103.6	100.6
Yugoslavia .	9	7	4	122.0	204.0	2,425	2,050	1,521	121	103	76	118.3	159.4
U.S.S.R. . .	9) 2,928	2,917	2,999	100.4	97.6	463,343	367,732	331,786	23,167	18,386	16,589	126.0	139.7
Canada . . .	62	48	51	130.3	123.4	12,280	10,540	9,466	614	527	473	116.5	129.7
U.S.A. . . .	921	930	809	99.0	113.8	213,820	232,300	177,076	10,691	11,615	8,854	92.8	120.8
Turkey . . .	...	52	63	...	...	...	6,054	8,326	...	303	416	...	...

(1) Including Ostmark and Sudetenland. — (2) Average 1932 to 1937. — (3) Not including crops for seed. — (4) Sugar-beet for factories. — (5) Including beets for distilling. — (6) Estimated on June 1. — (7) Present frontiers excluding Sub-Carpathian Russia. — (8) Territory at the end of 1937. — (9) Calculated.

Taiwan: The cane in old plantations was fairly satisfactory in December. Germination in young plantations was regular and uniform and growth was normal.

Netherlands Indies: Java and Madura. — In December rainfall was first light and later plentiful but not sufficient in all places. Plantations, which at the beginning of the month were suffering from drought, were in better condition at the end.

Wet weather continued during the first half of January with heavier falls but the same irregularity.

The condition of the cane improved but was still not fully satisfactory. Work proceeded everywhere except in places where rain was inadequate

No disease damage has been reported (*Anela*).

Egypt: The crop is ripening in favourable conditions. Cutting has not yet begun in the areas growing cane for the factories. Crop condition is normal.

Mauritius: The production of cane-sugar in 1939-40 is now estimated at 5,530,000 centals (277,000 short tons) against 7,084,000 (354,200) in 1938-39 and an average of 5,886,000 (294,300) in the years 1933-34 to 1937-38, percentages, 78.1 and 94.0

CURRENT INFORMATION ON VINES.

Argentina: The condition of vines at the beginning of December was generally good except in some parts of Mendoza, where hail had done serious damage, and in the Río Negro Valley, in which a reduction of about 20 per cent. on the forecast for production was expected owing to frosts in the last ten days of November.

WORLD PRODUCTION OF OLIVE-OIL IN THE 1939-40 SEASON

The results of the 1939-40 olive season have been, with a few exceptions, very good and total world olive-oil production is much larger than last year and is also larger, though to a lesser extent, than the average. The most important producing countries, which in 1938-39 had obtained very poor crops, this year report extra high yields; such is the case in Spain, Italy, Greece, Portugal and Tunisia, the five countries which between them produce almost the whole of the world olive-oil production. Weather conditions on the whole were favourable and the rain which fell at the end of the summer and in the autumn in the Mediterranean basin greatly reduced the damage from drought and the hot summer winds. Disease and insects did local damage to groves, but its extent was no more than normal except in some countries, such as Portugal.

World Production of Olive-oil

(thousand centals)

CONTINENTS	1939-40	1938-39	1937-38	1936-37	1935-36	Average 1930-31 to 1934-35
Europe	19,390	14,198	20,944	14,506	17,858	14,176
America	18	22	29	26	26	15
Asia	1,058	838	1,444	683	904	904
Africa	1,720	1,014	1,742	772	1,808	1,631
Oceania	0	0	0	0	0	0
<i>Total . . .</i>	22,181	16,072	24,159	15,987	20,596	16,726

Of the minor producing countries in which the olive crop was poor, there should be mentioned in particular the three Asiatic countries, Syria and Lebanon, Palestine and Cyprus.

In spite of the present statistical difficulties and the lack of official forecasts for several important producing countries, including Spain and Italy, a review is given of the yields obtained in the following countries:—

In *Spain*, according to reports from reliable sources, olive-oil production this year is estimated at 8.2 million centals (108.8 million American gallons), or approximately average.

In *Italy* the crop has been on the whole large, or even very large, in the south and varying from poor to good in the oil producing areas. Diseases and insects did local damage, attacks being particularly heavy in central Italy. The growth of olive-trees was good almost throughout the season. Drought and winds, however, caused shedding during July and the first half of August. The total production of olive-oil in Italy is estimated privately at 6.0 million centals (79.4 million gallons), or nearly 50 per cent. larger than in 1938-39 and 30 per cent. above the average of 1933-34 to 1937-38.

In *Greece* the influence of weather conditions on the growth of the olive trees and the maturation of the olives was on the whole favourable. During the summer excessive heat and drought did damage, that in some cases was serious, but the rain of the end of September and in October was favourable for the growth and maturation of olives. Attacks of insects and diseases were of variable extent and on the whole the damage did not exceed the normal. The ripening of olives during November, in spite of occasionally unfavourable weather, took place in very satisfactory conditions. The rather mild and wet weather of the first half of December was favourable for picking, while the frequent rain and even snow of the second half of December hampered the completion of these operations. Pressing was in full swing. In certain districts the acidity of the oil is rather high, owing to late attacks of *dacus* which had caused premature shedding. The production of table olives this year is estimated at 1,600,000 centals and of oil at 3.4 million centals (45.6 million American gallons), against 2,069,000 (27,750,000) in 1938-39, an increase of 65 per cent., and an average of 2,500,000 (33,900,000), an increase of 35 per cent.

In *Portugal* weather conditions affected rather seriously the growth of olive trees. Shedding was extensive and fly infestations, especially at the end of maturation, were very heavy; consequently, quality and yields are below the forecasts. Nevertheless, the crop of olives for oil extraction is estimated at 14.3 million centals and the production of oil at 1.5 million centals (20.6 million gallons), or 30 per cent. above the average and more than double the very poor production of 1938-39.

In *France*, the olive season was on the whole favourable, weather conditions having been favourable for flowering and fruit formation. There were insect infestations in some areas in summer, but the damage was on the whole limited. Considerable progress was realized in treatment, which had been rather neglected for several years; oil production is estimated as good and about equal to that of the 1938-39, season.

In *Yugoslavia*, owing to drought and hail which seriously damaged olive-trees in several areas, the olive crop is estimated as rather poor this year; oil production seems hardly likely to reach 77,000 centals (about 1,030,000 gallons).

Production of olive-oil in *Albania* is estimated as better than the 1938-39 figure, which was about average. Forecasts of oil production in 1939-40 are 44,000 centals (590,000 gallons). The severe drought of the summer dried up a large proportion of the blossom and provoked shedding.

In regard to the most important Asiatic countries, no official estimate of the results of the olive-oil season in Turkey is available; it appears, however, that oil production this year was about 900,000 centals (11.8 million American gallons), or considerably above the average.

The 1939-40 year was very unfavourable for oliviculture in *Syria and Lebanon*. Very bad weather damaged olive-groves at the time of flowering and fruit formation; in addition, fly infestation, particularly on the Lebanon littoral, did very serious damage. It is estimated that the production of green olives reached about 220,000 centals, or a quarter of the normal production; oil production is calculated at about 70,000 centals (900,000 gallons), or barely 20 per cent. of last year's or the average production.

In *Palestine* weather conditions during the summer of 1939 were not very favourable; dry winds in particular here and there did considerable damage. Maturation was slow for lack of moisture. Attacks of *Dacus* were very extensive and lowered the quality of the fruit. Total olive production is officially estimated at about 330,000 centals and oil production at 70,000 centals (900,000 gallons), or only 39 per cent. of the very large outturn of 1938-39 and 65 per cent. of the average.

In *Cyprus* the olive season made a good start; flowering was abundant but subsequently heat and drought caused considerable shedding of the fruit. Consequently, production is very poor, being estimated by the Government at 18,000 centals (235,000 gallons), or one of the poorest crops obtained for several years.

French possessions in North Africa have had good crops on the whole, superior to those of 1938-39 and the average.

In *Algeria* crop prospects are good, particularly in the *département* of Oran. Flowering and fruit formation during the summer varied from irregular to satisfactory. In some areas excessive heat, hot winds and flies did some not very serious damage. Olive-oil production appears to be about 330,000 centals (4.4 million gallons), against 220,000 (2.9 million gallons) last year and an average of 258,000 (3.4 million), an increase respectively of 46 and 28 per cent.

Following on a poor production last year, the new crop in *French Morocco* is large, being unofficially estimated at 220,000 centals (2,900,000 gallons), against 180,000 (2,350,000) in 1938-39 and an average of 210,000 (2,800,000) in the five preceding years.

In *Tunisia* weather conditions were generally favourable for blossoming; rains in the spring restricted fruit shedding, and heavy rains in August and September favoured growth. Attacks of insects and diseases were slight. Oil

production appears to be double that of 1938-39, which was 550,000 centals (7,350,000 gallons) and was slightly below the average.

As regards America, the following information may be given of the olive season in Argentina and the United States.

In *Argentina* the year was on the whole satisfactory; the product was of good quality and total yields are considered high. The condition of olive trees at the beginning of December was good in La Rioja but poor in Mendoza, where frosts during the winter did serious damage.

In the *United States* the condition of olive-trees was below normal in July and August, but subsequently improved slightly. The production of olives in California is estimated at 440,000 centals, against 880,000 in 1938-39 and an average of 475,000 in the five preceding years; percentages, 50.0 and 92.7.

Aggregating the official statistics received by the Institute from various governments and taking account of the other unofficial sources of information, particularly in regard to those countries which have suspended the publication of economic and statistical information owing to present events, world production of olive-oil in 1939-40 may be estimated at 22.2 million centals or 296.9 million American gallons (19.4 or 258.7 in Europe, 1.1 or 14.7 in Asia and 1.7 or 23.5 in Africa), against 16.1 million centals or 214.6 million American gallons in 1938-39 and an average of 19.2 or 255.7 in 1933-34 to 1937-38. This season's figure represents an increase of 38 per cent. on last season and of 15 per cent. on the average.

M. COSTA.

CURRENT INFORMATION ON FLAX.

U. S. S. R.: On December 1, 1939, the *kolkhozi* had delivered to the State 24.9 per cent of the flax fibre and 65.3 per cent. of the retted flax required by the contract for delivery.

Argentina Harvesting and threshing of maize were well advanced in December. As expected, the crop was on the small side.

India According to the first estimate, the area cultivated to linseed this season is 2,802,000 acres against 3,081,000 in 1938-39 and an average of 2,665,000 in the five years ending 1937-38, percentages, 90.9 and 105.1.

Area and Production of Flax.

COUNTRIES	† AREA						† PRODUCTION					
	1939	1938	Aver.	% 1939	1939	1938	Aver.	1939	1938	Aver.	% 1939	1939
	and	and	1933	and			1933	and	and	1933	and	
	1939-40	1938-39	1933-34	1939-40	1939-40	1938-39	1933-34	1939-40	1938-39	1933-34	1939-40	1938-39
	ooo acres		to 1937-38	1939-40	1939-40	1938-39	to 1937-38	ooo centals	ooo lb	to 1937-38	1939-40	1938-39
			1939-40	Average								Average
			= 100	= 100							= 100	= 100
<i>Fibre.</i>												
Germany (1)	143	136 7)	73	105.0	—	—	661 2)	449	66,139 2)	44,908	—	—
Belgium . . .	110	77	58	143.5	189.6	—	781	356	78,064	35,593	—	—
Bohemia	—	—	—	—	—	—	—	—	—	—	—	—
Moravia (Pr.)	11	10	—	116.0	—	—	—	—	—	—	—	—
Bulgaria . . .	9	8	5	117.9	175.3	—	6	6	604	619	—	—
Estonia . . .	57	58	63	98.3	90.7	129	168	184	12,875	16,798	18.396	76.6
Finland (2)	8	7	11	104.7	72.5	—	22	33	2,218	3,336	—	—
France . . .	—	94	69	—	—	—	525	392	52,493	39,180	—	—
Hungary . . .	10	8 2)	—	—	—	47	35 2)	31 2)	4,718	3,463 2)	3,088	—
Ireland . . .	—	4	3	—	—	—	15	15	1,460	1,537	—	—
Italy . . .	37 2)	30 2)	24	125.4	154.0	—	80	51	7,974	5,091	—	—
Latvia . . .	152	162	144	94.0	105.4	—	473	419	47,316	41,901	—	—
Lithuania (2)	205	192	183	106.6	112.2	629	568	588	62,898	56,844	58,760	110.7
Netherlands . .	62	51	25	120.4	243.7	390	429	197	39,048	42,935	19,671	90.9
Poland . . .	—	365	298	—	—	—	872	761	—	87,229	76,113	—
Romania . . .	28	37	62	74.6	44.9	—	140	194	—	13,950	19,361	—
Un. Kingd.	—	—	—	—	—	—	—	—	—	—	—	—
N. Ireland . . .	21	21	20	103.2	108.5	—	90	98	9,041	9,838	—	—
Yugoslavia . . .	—	35	30	—	—	—	285	236	28,478	23,617	—	—
U. S. S. R. (2)	—	4,650	5,351	—	—	13,963	12,037	12,266	139,324	1,203,728	1,226,634	115.0
Japan . . .	—	62	37	—	—	—	194	98	19,382	9,798	—	—
Egypt . . .	10	9	5	109.5	192.8	81	71	34	8,142	7,071	3,433	115.1
<i>Linseed.</i>												
									ooo bushels of 56 lb			
*Germany (1)	143	136 2)	73	105.0	—	—	522 2)	454	933 2)	810	—	—
*Belgium . . .	118	77	58	143.5	189.6	—	355	263	634	470	—	—
*Bohemia	—	—	—	—	—	—	—	—	—	—	—	—
Moravia (Pr.)	11	10	—	116.0	—	—	—	—	—	—	—	—
*Bulgaria . . .	9	8	5	117.9	175.3	—	18	22	32	40	—	—
*Estonia . . .	57	58	63	98.3	90.7	—	196	195	350	348	—	—
*France . . .	—	94	69	—	—	—	—	239	—	426	—	—
Hungary . . .	18	21 2)	21	—	—	138	154 2)	113 2)	246	276 2)	201	—
*Italy . . .	37 2)	30 2)	24	125.4	154.0	—	147	68	263	121	—	—
Latvia . . .	152	162	144	94.0	105.4	532	450	352	949	803	699	118.2
Lithuania (2)	205	192	183	106.6	112.2	694	650	695	1,239	1,160	1,240	106.7
*Netherlands . .	62	51	25	120.4	243.7	—	364	170	—	649	304	—
*Poland . . .	—	365	298	—	—	—	1,508	1,403	—	2,692	2,506	—
*Romania . . .	28	37	62	74.6	44.9	—	122	230	—	217	411	—
*Yugoslavia . . .	—	—	—	—	—	—	30	25	—	53	44	—
Total Europe	375	375	348	100.7	107.8	1,364	1,254	1,200	2,134	2,239	2,140	108.8
*U. S. S. R. (2)	—	5,605	6,030	—	—	—	—	15,952	—	—	28,486	—
Canada . . .	307	221	299	138.8	102.6	1,215	778	647	2,169	1,389	1,156	156.2
United States . .	2,284	936	1,298	244.0	175.9	11,385	4,565	4,418	20,330	8,152	7,889	249.4
*Mexico . . .	—	12	12	—	—	—	48	51	—	85	90	—
Total N. Am.	2,591	1,157	1,597	223.5	162.2	12,600	5,343	5,065	22,499	9,541	9,045	235.8
India . . .	3,894	3,890	3,428	100.1	113.6	9,968	10,326	8,982	17,800	18,440	16,040	96.5
Egypt . . .	10	9	5	109.5	192.8	59	61	39	106	108	69	97.5
*Fr. Morocco . .	—	56	41	—	—	—	112	165	—	201	294	—
Argentina . . .	7,600 11)	6,608 11)	7,198	115.0	105.6	27,558	31,085	37,920	49,211	55,510	67,714	88.7
Uruguay . . .	558	452	332	123.4	168.4	2,884	2,478	1,795	5,149	4,425	3,205	116.4
Totals . . .	15,028	12,491	12,903	120.3	116.4	54,433	50,547	55,001	97,199	90,263	98,213	107.7

The years indicated are those of the harvest, single years referring to the Northern Hemisphere, double years to the Southern. — * Not included in the totals — (1) Including Ostmark and Sudetenland. — (2) Not including Sudetenland. — (3) Flax and hemp. — (4) Present frontiers excluding Sub-Carpathian Russia. — (5) Average 1934 to 1937. — (6) Total area (for fibre and for seed). — (7) Dolgunetz variety. — (8) Dolgunetz and Kudriash varieties. — (9) Area according to the Plan. — (10) Average 1933 to 1935. — (11) Area sown

CURRENT INFORMATION ON COTTON.

Greece: Weather conditions in the first half of November were very favourable for cotton picking, which was completed nearly everywhere at the end of the month. The unfavourable weather of the second half of November did not do serious damage to cotton crops, since the greater part had already been picked. Quality is stated to be very good.

U. S. S. R.: Unginned cotton production in Turkmenistan, which is the most important cotton growing area of the U. S. S. R., during the present season was 1,600,000 metric tons; the average yield per acre is about 1,500 lb. of unginned cotton. According to the Government Plan, the irrigated area in Turkmenistan will be increased during the next six years by 1,060,000 acres, of which 250,000 acres will be devoted to an extension of cotton cultivation. Compared with the area at present used for cotton cultivation in Turkmenistan, the increase forecast is about 10 per cent.

Area and Production of Cotton.

COUNTRIES	AREA					PRODUCTION OF GINNED COTTON									
	1939-40	1938-39	Average		% 1939-40	1939-40	1938-39	Average		1939-40	1938-39	Average		% 1939-40	
			1933-34 to 1937-38					1933-34 to 1937-38				1933-34 to 1937-38			
			1938-39	Average				1938-39	Average			1938-39	Average		
															= 100
ooo acres						ooo centals			ooo bales of 478 lb.						
Bulgaria	166	136	78	122.2	212.6	...	153	138	...	32	29	...	...	...
Greece	191	187	121	102.1	157.6	300	321	240	63	67	50	93.4	125.1	...	
Italy . . . . .	...	91	20	...	...	...	209	37	...	44	8	...	...	...
Romania	21	12	3	170.9	621.4	28	13	5	6	3	1	222.2	534.6	...	
Yugoslavia	14	14	4	100.3	312.9	...	27	7	...	6	1	...	...	...
U. S. S. R.	5,190	5,147	4,977	100.8	104.3	19,400	18,500	12,900	4,050	3,870	2,707	104.8	149.9	...	
United States (1)	23,928	24,248	29,427	98.7	81.3	56,366	57,094	61,821	11,792	11,944	12,933	98.7	91.2	...	
Br. West Indies . . . . .	...	22	17	...	...	...	21	19	...	4	4	...	...	...
Mexico . . . . .	...	633	623	...	...	...	1,462	1,405	...	306	294	...	...	...
Argentina	(2) 903	(*) 1,005	(2) 832	89.8	108.5	...	1,455	1,195	...	304	250	...	...	...
Brazil : North	2,350	2,224	2,295	105.6	102.3	3,307	3,064	3,293	692	641	689	107.9	100.4	...	
do : South . . . . .	...	3,700	2,461	...	...	...	5,861	4,297	...	1,226	899	...	...	...
Peru . . . . .	...	395	377	...	...	...	1,912	1,696	...	400	355	...	...	...
Burma	(2) 372	(2) 411	(2) 494	90.6	75.3	414	426	451	87	89	94	97.4	91.8	...	
China (3) . . . . .	...	...	7,319	...	...	...	...	14,283	...	...	2,988	...	...	...
Cyprus . . . . .	...	9	11	...	...	8	8	11	2	2	2	97.7	67.2	...
Chosen . . . . .	...	577	506	...	...	...	894	845	...	187	177	...	...	...
India (4)	20,460	23,046	23,216	88.8	88.1	17,496	19,184	20,136	3,660	4,013	4,213	91.2	86.9	...	
do. (5) . . . . .	...	23,553	24,630	...	...	...	20,480	22,049	...	4,285	4,613	...	...	...
Iraq . . . . .	...	79	45	...	...	...	64	29	...	13	6	...	...	...
Japan . . . . .	...	2	2	...	...	...	4	3	...	9	7	...	...	...
Syria	103	93	64	110.8	161.7	...	185	96	...	39	20	...	...	...
Turkey . . . . .	...	680	565	...	...	...	1,462	1,030	...	306	215	...	...	...
Belgian Congo . . . . .	...	980	752	...	...	...	772	615	...	161	129	...	...	...
Egypt	1,687	1,852	1,848	91.1	91.3	8,677	8,260	8,871	1,815	1,728	1,856	105.0	97.8	...	
Kenya . . . . .	...	...	...	...	...	...	40	58	...	8	12	...	...	...
Nigeria (6) . . . . .	...	...	...	...	...	...	...	(7) 156	...	...	(7) 33	...	...	...
Nyasaland . . . . .	...	92	71	...	...	...	49	47	...	10	10	...	...	...
Uganda	1,574	1,530	1,377	102.9	114.2	(8) 1,380	(8) 1,208	(8) 1,281	(8) 289	(8) 253	(8) 268	114.2	107.8	...	
Anglo-Eg. Sudan	427	458	402	93.1	106.2	...	1,104	1,258	1,077	231	263	225	87.7	102.4	...
*Tanganyika . . . . .	...	...	...	...	...	(9) 314	(8) 199	(8) 195	(9) 66	(8) 42	(8) 41	...	...	...

(1) See *Summary of Cotton Reports*. — (2) Sown area. — (3) According to the Chinese Cotton Statistics Association, Shanghai. — (4) Third Report, relating to conditions up to the beginning of December, in the entire cotton area of India. — (5) Final estimates. That of last year is subject to revision. — (6) Northern Provinces. — (7) Cotton lint bought, American variety only. — (8) Exports. — (9) Quantities available for export.

Argentina: The excessive rain of October and November hampered sowing operations in the Chaco, Formosa and Corrientes. In some districts it was necessary to resow the land. At the beginning of December sowing was completed in Santiago del Estero and Santa Fe.

United States:

Summary of the Cotton Reports issued by the Government of the United States, during the cotton season (August 1-July 31).

	Provisional estimates for dates indicated 1939-40	Final estimates		Percent 1939-40	
		1938-39	Average 1933-34 to 1937-38	1938-39 = 100	Aver. = 100
<i>Report referring to July 1:</i>					
Area in cultivation (acres)	24,943,000	25,018,000	32,178,000	99.7	77.5
<i>Report referring to August 1:</i>					
Area left for harvest (acres) (1)	24,424,000	(2) 24,248,000	(2) 29,427,000	100.7	83.0
Crop condition (per cent. of normal)	74	78	(3) 70	—	—
Production (4)	11,412,000	11,944,000	12,933,000	95.5	88.2
Yield of lint per acre, in lb.	223.7	235.8	(3) 190.8	94.9	117.2
Cotton ginned to August 1 (5)	137,076	157,865	109,900	86.8	124.7
Cotton ginned to August 10 (5)	300,677	314,616	370,885	98.4	83.5
<i>Report referring to September 1:</i>					
Area left for harvest (acres) (6)	24,222,000	(2) 24,248,000	(2) 29,427,000	99.9	82.3
Crop condition (per cent. of normal)	70	65	(3) 61	—	—
Production (4)	12,380,000	11,944,000	12,933,000	103.6	95.7
Yield of lint per acre, in lb.	244.7	235.8	(3) 190.8	103.8	128.2
Cotton ginned to September 1 (5)	1,402,970	1,335,643	1,436,526	105.0	97.7
Cotton ginned to September 16 (5)	3,876,616	3,634,922	3,303,775	106.6	117.3
<i>Report referring to October 1:</i>					
Crop condition (per cent. of normal)	68	66	(3) 61	—	—
Production (4)	11,928,000	11,944,000	12,933,000	99.9	92.2
Yield of lint per acre, in lb.	235.7	235.8	(3) 190.8	100.0	123.5
Cotton ginned to October 1 (5)	6,686,712	6,577,109	5,878,909	101.7	113.7
Cotton ginned to October 18 (5)	8,877,681	8,025,828	8,315,616	99.5	106.8
<i>Report referring to November 1:</i>					
Production (4)	11,845,000	11,944,000	12,933,000	99.2	91.6
Yield of lint per acre, in lb.	231.1	235.8	(3) 190.8	99.3	122.7
Cotton ginned to November 1 (5)	10,080,535	10,124,773	9,811,853	99.6	102.7
Cotton ginned to November 14 (5)	10,683,371	10,742,579	10,806,724	99.4	98.9
<i>Report referring to December 1:</i>					
Area in cultivation, on July 1 (acres)	24,832,000	25,018,000	32,178,000	99.3	77.2
Area left for harvest (acres) (7)	23,928,000	(2) 24,248,000	(2) 29,427,000	98.7	81.3
Production (4)	11,792,000	11,944,000	12,933,000	98.7	91.2
Yield of lint per acre, in lb.	235.0	235.8	(3) 190.8	100.0	123.6
Average gross weight of running bale, lb (8)	514.0	513.8	(3) 511.2	100.0	100.5
Cotton ginned to December 1 (5)	11,111,422	11,230,522	11,630,355	98.0	95.5
Cotton ginned to December 13 (5)	11,275,550	11,412,139	11,957,256	98.8	94.3
Cotton ginned to January 16 (5)	11,404,924	11,552,913	12,356,445	98.7	92.3

(1) Area in cultivation on July 1 less the ten-year (1929-38) average abandonment, about 2.2 per cent. — (2) Area actually harvested. — (3) Ten-year (1928-37) average. — (4) In bales of 478 lb. net weight and exclusive of linters. — (5) In running bales, counting round bales as half bales and exclusive of linters. (6) Per cent. of the acreage in cotton on July 1, 1939, which has been, or will be, abandoned: 2.9, compared with 3.1 in 1938. — (7) Per cent. of the acreage in cotton on July 1, 1939, which has been abandoned: 3.6 — (8) Counting round bales as half bales and exclusive of linters.

Burma: According to the third forecast of the cotton crop, issued on December 11, 1939, the area sown is estimated at 371,800 acres. The area destroyed being 23,460 acres, the area matured, i. e. area sown less area destroyed, is 348,340 acres, which is 752 acres less than the final figure for last year. The crop is reported to be better than last year. Production is estimated at 414,400 centals (86,700 bales) of 478 lb. net weight) of cotton lint, of which 380,800 centals (79,700 bales) are likely to be available for export.

India: In the Punjab the weather in December was dry. Crops were in average condition in irrigated areas and under average in unirrigated areas in December. Premature opening of the bolls of American cotton was reported in Gujrat, Shahpur, Lyallpur, Montgomery and Multan. Damage by *tela* occurred in parts of Multan.

In the Central Provinces the weather was clear and cool. Picking was still going on at the end of December.

Turkey: The Ministry of Agriculture has distributed during 1939 in the provinces of Seyhan and the south 23,800 centals of Cleveland cottonseed, 22,700 centals

of Acala, and 15,400 centals of seed of native varieties, a total of about 62,000 centals. Over 200 cotton sowing machines were made available for growers. Cotton lint production in 1939 is forecast at about 277,000 bales of 478 lb. net weight.

Egypt: Cotton ginned up to the end of December, in bales of 478 lb. net weight was as follows.

Varieties	1939	1938	1937	1936	1935	1934	1933
Giza 7	350,350	240,898	324,212	285,664	193,043	112,080	72,152
Sakellariidis	30,976	28,099	65,381	80,009	129,395	117,929	142,484
Other varieties above:							
1 1/4"	68,759	64,057	74,049	65,499	68,270	36,176	67,034
1 1/8"	54,268	28,644	21,955	20,787	31,632	28,591	52,854
1 1/8"	742,366	687,341	848,112	926,555	873,030	732,788	807,968
Total	1,216,719	1,049,039	1,333,709	1,378,514	1,294,370	1,027,564	1,143,392
Scario	22,635	19,633	22,365	28,243	27,194	20,894	22,830
Total production (including Scario)	1,215,221	1,728,090	2,281,223	1,887,164	1,768,581	1,565,583	1,776,908

* Second estimate.

Uganda: Good rains fell during the first half of November in most parts of the country, improving the condition of the crop where it had previously suffered to some extent from drought, especially in the Eastern Province. Only slight and localized damage from insects and diseases was reported. During the second part of the month the weather, although less rainy, continued to be favourable to the crop, and prospects were on the whole satisfactory.

CURRENT INFORMATION ON HEMP.

Argentina: Hemp crops in Santa Fe were in good condition in December.

Area and Production of Hemp.

COUNTRIES	AREA					PRODUCTION				
	1939	1938	Average 1933 to 1937	% 1939		1939	1938	Average 1933 to 1937	% 1939	
				1938	Aver- age				1938	Aver- age
ooo acres				ooo lb						
Fibre.										
Germany	1) 39	1) 32	2) 9	121.7	—	...	2)3) 260	2)4) 122	...	...
Bulgaria	23	25	16	93.4	146.3	14,483	9,061	7,098	159.8	204.0
France . . . . .	...	9	8	...	...	...	9,231	7,933	...	...
Italy	224	225	173	99.6	129.5	...	239,487	168,180	...	...
Poland . . . . .	...	83	82	...	...	...	28,306	24,976	...	...
Romania	143	126	119	113.5	119.8	...	66,790	57,155	...	...
Yugoslavia . . . . .	...	141	108	...	...	...	122,135	90,332	...	...
U. S. S. R.	5) 986	1,248	6) 1,467	79.0	67.2	...	...	7) 447,247	...	...
Japan . . . . .	...	17	15	...	...	...	19,847	16,890	...	...
Manchukuo . . . . .	...	89	49	...	...	...	38,422	16,094	...	...
Syria	21	12	8	174.0	273.3	...	7,637	4,962	...	...
Hempseed.										
Germany	1) 39	1) 32	2) 9	121.7	—	...	2)3) 174	2)4) 78	...	...
Bulgaria	23	25	16	93.4	146.3	8,459	4,870	4,855	173.7	174.2
France . . . . .	...	9	8	...	...	...	...	1,636	...	...
Italy	224	225	173	99.6	129.5	...	6,221	5,601	...	...
Poland . . . . .	...	83	82	...	...	...	43,292	40,185	...	...
Romania	143	126	119	113.5	119.8	...	54,536	45,819	...	...
Yugoslavia	—	—	—	—	—	...	6,597	5,433	...	...
Manchukuo . . . . .	...	121	4) 151	...	...	...	80,350	4) 95,124	...	...
Syria	21	12	8	174.0	273.3	...	1,368	1,133	...	...

(1) Including Ostmark and Sudetenland. — (2) Excluding the Sudetenland and Memel. — (3) Excluding Ostmark. — (4) Average 1935 to 1937. — (5) Area provided for in the Plan. — (6) Average 1933 to 1935. — (7) Average 1933 and 1934.

CURRENT INFORMATION ON TOBACCO.

Greece: Curing was general at the end of November and some sales had been made. In all producing districts, the areas which may be cultivated are being revised downwards. In certain districts where the crop is of no economic importance, cultivation has been suspended altogether.

Yugoslavia: An increase in tobacco production of 20 to 25 per cent. over last year is confirmed. The quality of the crop is very good.

Area and Production of Tobacco.

COUNTRIES	AREA					PRODUCTION				
	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40		1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40	
				1938 and 1938- 1939 = 100	Aver- age = 100				1938 and 1938- 1939 = 100	Aver- age = 100
ooo acres					ooo lb.					
Albania . . . . .	...	5	4	...	...	...	4,612	3,171	...	...
Germany (1) . . . .	...	33	31	...	...	...	73,855	72,297	...	...
Belgium	7	5	7	124.6	93.4	...	10,529	14,683	...	...
Bulgaria	105	77	82	137.5	128.4	77,933	57,095	66,476	136.5	117.2
France . . . . .	...	45	45	...	...	...	73,119	76,544	...	...
Greece	208	202	216	103.1	96.4	121,158	91,656	129,193	132.2	93.8
Hungary	2) 39 3)	35 3)	39	—	—	2) 48,852 3)	43,062 3)	47,045	—	—
Italy . . . . .	...	81	83	...	...	...	92,758	97,488	...	...
Poland . . . . .	...	20	13	...	...	...	32,203	21,818	...	...
Romania	53	43	35	125.0	152.2	...	27,207	22,291	...	...
Switzerland . . . .	...	1	1	...	...	...	3,042	2,289	...	...
Yugoslavia . . . . .	...	43	35	...	...	4) 40,786	32,425	27,097	125.8	150.5
U. S. S. R. . . . .	...	5) 504	490	...	...	...	...	6) 438,192	...	...
Canada	90	84	52	107.7	172.9	94,664	98,341	51,464	96.3	183.9
Cuba . . . . .	...	112	112	...	...	...	55,321	44,640	...	...
United States . . .	1,942	1,600	1,529	121.3	127.1	1,769,639	1,376,471	1,293,626	128.6	136.8
Mexico . . . . .	...	52	39	...	...	...	41,723	29,975	...	...
Burma . . . . .	...	96	99	...	...	...	95,003	98,112	...	...
Chosen . . . . .	...	48	40	...	...	...	61,695	44,619	...	...
India 7) . . . . .	...	1,235	1,206	...	...	...	1,124,480	1,269,636	...	...
Japan	107	92	85	116.2	124.7	180,802	144,602	144,095	125.0	125.5
Manchukuo . . . . .	...	71	—	...	...	...	43,619	—	...	...
Palestine . . . . .	...	7	7	...	...	...	2,601	2,722	...	...
Syria and Lebanon .	...	11	14	...	...	...	7,518	8,379	...	...
Transjordan . . . .	...	...	2	...	...	...	2,780	883	...	...
Turkey . . . . .	...	208	167	...	...	...	117,267	110,141	...	...
Algeria . . . . .	...	58	54	...	...	...	42,007	39,406	...	...
Tunisia	1	1	1	106.1	80.8	...	850	1,335	...	...
Argentina . . . . .	...	45	36	...	...	...	40,490	29,711	...	...
Nyasaland 8) . . .	...	71	43	...	...	12,700	17,929	14,844	70.8	85.6
Australia . . . . .	...	8	11	...	...	...	3,922	4,840	...	...

(1) Former territory; production for sale — (2) Present frontiers, excluding Sub-Carpathian Russia. — (3) Territory at the end of 1937. — (4) Unofficial estimate — (5) According to the Plan. — (6) Average 1933, 1934 and 1936. — (7) Not including Burma. — (8) European and native plantations

Prices are appreciably higher this season and growers expect good returns. In view of this situation, the Government has authorized the cultivation of tobacco in areas where it was previously prohibited and is even granting assistance to growers.

CURRENT INFORMATION ON HOPS.

Area and Production of Hops.

COUNTRIES	AREA					PRODUCTION				
	1939	1938	Average 1933 to 1937	% 1939		1939	1938	Average 1933 to 1937	% 1939	
				1938	Average				1938	Average
ooo acres				ooo lb						
Germany (1) . . .	...	21 1	24 2	...	...	...	(2) 21,867	18,297	...	...
Belgium	2.0	18	21	111.0	97 4	...	2,105	2,555	...	...
France . . . . .	...	4.1	4.6	...	...	...	4,687	4,635	...	...
Hungary . . . . .	...	0.2	0.2	...	...	...	123	147	...	...
Poland . . . . .	...	8.2	7.5	...	...	...	5,037	3,408	...	...
Romania	0 1	0 1	0 1	183.3	59.5	35	21	41	168 1	84.5
United Kingdom										
Engl and Wales.	18.9	18.5	17.9	102.4	105.5	...	28,784	27,104	...	...
Yugoslavia . . .	...	7.6	6.4	...	...	...	3,527	3,917	...	...
—										
Canada . . . . .	...	1.1	1.1	...	...	...	1,769	1,552	...	...
United States . . .	31.2	31.5	34.2	99.0	91.1	38,570	35,261	40,146	109.4	96.1

(1) Not including Sudetenland. — (2) Not including Ostmark.

CURRENT INFORMATION ON OTHER PRODUCTS:

Cacao.

British Countries THE CACAO SCHEME. — The United Kingdom Government has undertaken as a war measure, to purchase the whole of the 1939-40 crop of British West African cacao and the larger part of the British West Indian and Ceylon crops, at fixed prices, the quantities to be based on normal shipments to the United Kingdom in past seasons. Since the United Kingdom normally consumes about a third of the total quantity produced by the territories concerned, the British Government thus takes charge of finding markets for the bulk of the crop. The Government will act through the established shippers in the colonies, who are appointed agents on an agreed basis. Each shipper will be allotted a share of total purchases, based, broadly speaking, in the case of the larger shippers, on purchases over the last three seasons, and in the case of the smaller shippers, many of whom have only recently entered the trade, on last season's purchases.

The prices paid to producers will be fixed for the season on a basis of 9s per load of 60 lb. for Gold Coast Good Fermented and £ 16 10s. 0d. per ton of 2,240 lb. for Nigerian f. a. q. cacao, ex scale, port of shipment. For cacao produced in Trinidad, Windward Islands and Ceylon the prices will be determined in relation to the prices paid for West African cacao.

A moratorium on cacao sales and purchases was declared in Gold Coast and Nigeria as from November 13, 1939, in order that the necessary arrangements for intro-

ducing the scheme might be made by the Colonial Governments. These arrangements included the setting up of local control organizations, which will obtain returns of existing stocks and contracts and make such other local arrangements as may be required.

Sales will be effected in the United Kingdom and other markets so far as possible through normal trade channels. An Advisory Committee, representing the firms with organizations in the United Kingdom engaged in shipping cacao from colonial dependencies is being constituted.

A central organization has been set up in the United Kingdom under the Ministry of Food, while in the Gold Coast and Nigeria the Governments have appointed local controllers.

Gold Coast and Togoland under British Mandate: SITUATION IN OCTOBER: MAIN CROP 1939-40. — The scarcity of rain continued in October as in September. This advanced ripening as compared with earlier indications but may have an adverse effect on final yield. Pod count data obtained from 42 Observation Plots indicated that at the end of October the number of ripe pods on trees was 40 per cent. of the number recorded at the same time last year, while the total pods recorded on Observation Plots at the end of October this year amount to 67 per cent. of the total at the end of October last year. Weather conditions, though only moderate for growth, were favourable for drying.

At the end of October about 40 per cent. of the crop was already ripe over the whole production area (50 per cent. in Ashanti) and 20 per cent. was estimated to be already harvested, while about 11 per cent. had been marketed.

Marketing proceeded rapidly during the last fortnight in October, farmers everywhere being reported to be selling freely. The first picking had been a heavy one and there were indications of hasty fermentation and drying. Samples taken from stocks in farmers' stores in Ashanti, Eastern Province and Togoland showed that there were a considerably greater proportion of Grade I cacao in farmers' hands in the Eastern Province and Togoland and a considerably smaller proportion in Ashanti, as compared with last year. Slate and underfermented beans were the predominant defects.

At a meeting held in Accra on November 14, 1939, the Cacao Crop Estimates Committee decided to make no change in the previous month's estimate for the main crop 1939-40.

MOVEMENT. — Movement statistics for October are as follows:

	October 1939	October 1938
	(million lb.)	
Railway off-loadings, Takoradi	5.0	4.4
<i>Exports:—</i>		
Takoradi	3.0	4.0
Accra	15.2	10.6
Other ports	2.4	4.1
<i>All ports</i>	<i>21.5</i>	<i>18.7</i>
Eastern Frontier	0.2	0.3
<i>Total exports</i>	<i>71.7</i>	<i>19.0</i>

SITUATION IN NOVEMBER MAIN CROP 1939-40. — During November the weather was favourable for drying in all districts, but there was still a rather larger proportion than usual of slate and germinated beans in cacao marketed, this being due to earlier unfavourable conditions.

By the end of the month it was estimated that 67 per cent. of the crop was already ripe, 49 per cent. had been harvested, 22 per cent. marketed and 27 per cent. remained in farmers' hands.

Marketing was at a standstill owing to the moratorium on cacao sales imposed until the Cacao Control Scheme comes into operation

CROP ESTIMATE. — At a meeting held in Accra on December 11, 1939, the Cocoa Crop Estimates Committee decided to make no change in the previous estimate of 250,000 long tons (560 million lb.) for the main crop 1939-40

MOVEMENT. — Movement statistics for November are as follows

	November 1939 (million lb.)	November 1938
Railway off-loadings, Takoradi	19.7	21.2
<i>Exports —</i>		
Takoradi	9.9	10.5
Accra	28.5	18.8
Other ports	2.5	4.5
<i>All ports</i>	10.9	33.8
Eastern Frontier	0.4	1.8
<i>Total exports</i>	41.3	35.6

Tea.

India In North India seasonable conditions continued during October and with the approach of the cold weather crop prospects became only fair, to the end of October there was an increase of 3,178,000 lb. on the corresponding outturn of the previous year. In South India northeast monsoon conditions continued and crop prospects were favourable, outturn was 5.7 per cent. ahead of the previous year

Coffee.

Ecuador: According to the latest official report received, October was very hot and dry. The condition of coffee plantations on November 1 was average.

Guatemala The flowering of coffee shrubs in 1939-40 was normal and promises a good crop on the whole, despite local damage by excessive rain.

Dominican Republic Strong winds in September reduced coffee yields in the south. Crop prospects in the country as a whole, however, remained good.

Venezuela The latest official reports confirm that coffee production in 1939-40 is considerably greater than in 1938-39. The condition of coffee plantations in October was on the whole normal.

Angola: The latest official report confirms that the 1939-40 coffee crop is, on average,

Hawaii: Weather in November was favourable for coffee cultivation. The condition of crops on December 1 was normal.

New Caledonia: Production of Arabica coffee this year, despite floods, in some areas, is rather large. Prospects of the Robusta variety are also good

Groundnuts.

Argentina: The condition of groundnuts in December was excellent in the principal producing areas.

Burma: According to the third report, the area under groundnuts in 1939-40 is estimated at 767,690 acres against the final estimate of 814,698 acres in 1938-39 and an average of 810,480 acres in 1936-37 and 1937-38; percentages, 94.2 and 94.7

Netherlands Indies. Java and Madura. — The Department of Agricultural Statistics of the Central Statistical Office communicates the following details of the groundnut area—

	1939 acres	1938 acres
Area harvested in October	54,100	66,500
Area harvested from January 1 to October 31 .	481,600	525,400
Area of standing crops at the end of October. .	153,700	165,600
Area harvested in November	55,600	68,700
Area harvested from January 1 to November 30	537,500	594,100
Area of standing crops at the end of November.	150,200	160,400

Egypt: Lifting was completed by mid-December. The yield per acre was rather better than average.

Colza and Sesame.

Hungary: Severe frosts in the first half of January did severe damage to colza crops.

Romania. According to the most recent estimate, the area cultivated to colza in 1939 was about 150,500 acres against 206,000 in 1938 and 195,200 on the average of the five years ending 1937; percentages 73.1 and 77.1. The corresponding production is estimated at about 1,150,000 centals against 1,160,000 and 810,200; percentages, 99.2 and 143.0

India: According to the first report, the area under rape and mustard in 1939-40 is estimated at 2,809,000 acres against 2,736,000 acres in 1938-39 and an average of 2,912,000 acres in 1933-34 to 1937-38; percentages, 102.7 and 96.5.

(Telegram of January 18): According to the final estimate, the area cultivated to sesame in 1939-40 was 3,898,000 acres against 4,030,000 in 1938-39 and 4,250,000 on the average of the five years ending 1937-38; percentages 96.7 and 91.7. The corresponding production is estimated at about 8,826,000 centals (441,300 short tons) against 8,221,000 (411,000) and 9,610,000 (480,500); percentages 107.4 and 18.9.

CURRENT INFORMATION ON FODDER CROPS.

*Denmark:**Production of principal Fodder Crops.*

		1939	1938	Average 1933-37		% 1939 1938 = 100	% 1939 Average = 100
Kohl-rabi	(000 centals)	255,737	253,091	259,307	}	101.0	98.6
	(000 sh. tons)	12,787	12,654	12,965			
Mangels	(000 centals)	197,535	199,519	204,436	}	99.0	96.0
	(000 sh. tons)	9,877	9,976	10,222			
Turnips	(000 centals)	11,905	14,110	21,413	}	84.4	55.6
	(000 sh. tons)	505	705	1,071			
Rotation meadows .	(000 centals)	26,676	26,676	32,735	}	100.0	81.5
(hay).	(000 sh. tons)	1,334	1,334	1,637			
Permanent meadows	(000 centals)	8,818	9,700	11,617	}	90.9	75.9
(hay)	(000 sh. tons)	441	485	581			

France. The still plentiful grazing has permitted the putting of stock out to pasture whenever weather permitted, thus realizing important economies in dry fodder or concentrated feeds.

Hungary. Food supplies are barely sufficient for the winter. A shortage was felt in mid-January in some places and stock were being fed with cereal husks, cereal straw and maize stalks.

Greece. The rather wet weather of November was favourable for the growth of fodder crops, the sowing of some species of which was very active. Frequent rains in the second half of December were also very favourable for the growth of grasses and other fodder crops.

Ireland. The weather during the first half of December was mild, but rain was general throughout the period. The second half was dry with light frosts towards the end of the month. These conditions were favourable for pastures, which, as a result of comparatively mild conditions in the early winter months, continued to provide a fair amount of grass, and no heavy inroads were made on the reserves of roots and concentrated foods or other fodder.

United Kingdom. The following table shows the definitive estimates of area and production of the principal fodder crops in 1939 in England and Wales, as compared with 1938 and the average of 1933 to 1937.—

	<i>Area.</i>			% 1939 1938 Average = 100	
	1939	1938	Average 1933-37		
	(acres)				
Mangels	208,900	212,500	237,200	98.3	88.0
Turnips and swedes	394,200	421,200	491,300	93.6	80.2
Rotation meadows for hay .	1,302,900	1,184,100	1,348,800	110.0	96.6
Permanent meadows for hay.	4,611,600	4,229,300	4,682,600	109.0	98.5

Production.

	1939	1938	Average 1933-37	^{of} 1938 = 100	¹⁹³⁹ Average = 100
	(ooo centals)				
Mangels	88,211	80,618	97,610	109.4	90.4
Turnips and swedes	110,813	113,814	114,307	97.4	96.9
Rotation meadows (hay) . .	38,080	28,694	39,043	132.7	97.5
Permanent meadows (hay) . .	101,584	70,134	102,274	144.8	99.3
	(ooo short tons)				
Mangels	4,411	4,031	4,881	109.4	90.4
Turnips and swedes	5,511	5,691	5,715	97.4	96.9
Rotation meadows (hay) . .	1,904	1,435	1,952	132.7	97.5
Permanent meadows (hay) . .	5,079	3,507	5,114	144.8	99.3

Argentina: Pastures in December were on the whole in good condition.

Canada: According to a report dated November 17, 1939, the production of the principal fodder crops in Canada in 1939 was as follows:

	1939	1938	Average 1933-37	[%] 1938 = 100	¹⁹³⁹ Average = 100
Hay (1) and clover. (ooo centals)	286,600	275,960	254,040	103.9	112.8
(ooo short tons)	14,330	13,798	12,702		
Alfalfa (ooo centals)	43,340	41,220	36,050	105.1	120.2
(ooo short tons)	2,167	2,061	1,802		
Fodder maize . . . (ooo centals)	90,100	88,260	72,290	102.1	124.6
(ooo short tons)	4,505	4,413	3,614		
Turnips, etc. . . . (ooo centals)	38,430	38,160	36,955	100.7	104.0
(ooo short tons)	1,921	1,908	1,848		

(1) From sown meadows.

Egypt: Growth of clover was better than in the preceding month owing to the cotton worm which delayed *barsim* cutting in Lower Egypt by about three weeks. The first cut is continuing and the second has begun in Middle Egypt. Growth is below average on the whole.

LIVESTOCK AND DERIVATIVES

LIVESTOCK IN CANADA.

The Dominion Bureau of Statistics has published estimates of the number of livestock on farms at June 1, 1939. These are reproduced below with the numbers as at June 1 and December 1 in the years 1931 to 1938.

Summary. — Estimates of the numbers of animals on farms at June 1, 1939, indicated a considerable increase in Canada's livestock population during the preceding year. Increases in pigs, horses and poultry were recorded, while decreases occurred in sheep and cattle. The increase in pig numbers from 3.5 million in June, 1938, to 4.3 million in June, 1939, represents a gain of 23 per cent. Hens and chickens increased 9 per cent. and turkeys were up 21 per cent. There was a decline of less than one-half of one per cent in cattle and of 1.4 per cent in sheep.

Increases in pig numbers are the result of favourable feed and price conditions prevailing during the fall and winter of 1938-39. Poultry production responded to the same favourable conditions and a marked increase occurred in turkeys. The slight increase in numbers of horses indicates a reversal of the downward trend in numbers which prevailed from 1921 to 1938.

Cattle numbers, which have been declining since 1934, continued the trend in 1939. The decrease, however, was small and indicates a turning point in the cattle number cycle.

Horses. — Numbers of horses on farms at June 1, 1939 were estimated at 2,824,390 compared with 2,820,760 at June 1, 1938. The trend in numbers of horses was downward from 1921 to 1938 and the slight increase in 1939 is a result of increased colt production in the past few years. In view of greater colt production, numbers of horses on farms are expected to increase for several years. Increases in the horse population in 1939 occurred in six of the nine provinces. Decreases were shown in Ontario, Manitoba and Saskatchewan.

Number of Horses on Farms.

	June 1
1939	2,824,000
1938	2,821,000
1937	2,883,000
1936	2,892,000
1935	2,931,000
1934	2,933,000
1933	2,984,000
1932	3,089,000
1931	3,114,000

Cattle. — Numbers of cattle on farms at June 1, 1939 totalled 8,474,500 compared with 8,511,200 at June 1, 1938, and 8,840,000 at June 1, 1937. Numbers of cattle on farms reached a high point in 1934. In 1936 and 1937, the downward trend in numbers was accelerated by drought conditions in the Prairie Provinces. The decline from June 1, 1938, to June 1, 1939, represents less than one-half of one per cent.

Numbers of milk cows on farms at June 1, showed little change from the June 1, 1938, estimate. Practically all of the decrease occurred in cattle other than milk cows. The number of cows bred to calve between June and November 1939 was estimated to have been 2.7 per cent. greater than the corresponding number of the preceding year.

Numbers of Cattle on Farms.

	June 1	December 1
1939	8,474,000	...
1938	8,511,000	8,091,000
1937	8,840,000	8,080,000
1936	8,841,000	8,337,000
1935	8,821,000	8,431,000
1934	8,952,000	8,485,000
1933	8,876,000	8,460,000
1932	8,511,000	8,123,000
1931	7,973,000	7,864,000

Sheep. — A decrease of 14 per cent. in numbers of sheep was indicated. There were 3,365,800 sheep on farms at June 1, 1939, compared with 3,415,000 at June 1, 1938. Decreases occurred in all provinces with the exception of Saskatchewan and Alberta.

Numbers of Sheep on Farms.

	June 1	December 1
1939	3,366,000	...
1938	3,415,000	2,672,000
1937	3,340,000	2,674,000
1936	3,327,000	2,626,000
1935	3,399,000	2,628,000
1934	3,421,000	2,738,000
1933	3,386,000	2,738,000
1932	3,644,000	2,812,000
1931	3,627,000	2,762,000

Pigs. — The number of pigs on farms at June 1, 1939, was estimated at 4,294,000 compared with 3,486,900 at June 1, 1938, and 3,963,000 at June 1, 1937. Pig numbers at June 1, 1939, were the highest recorded at that date

since 1932, when 4,639,000 were reported. Increases in numbers were recorded in all provinces, with the greatest occurring in Alberta and Saskatchewan. The gain in the latter province was particularly marked. In 1936 and 1937, drought and the resultant scarcity of feed had cut the livestock population drastically. At June 1, 1939, there were 470,000 pigs on farms in Saskatchewan as compared with only 267,600 at June 1, 1938. With a population of 993,200 pigs at June 1, 1939, the gain for Alberta over June 1, 1938, was 286,200 pigs. In Quebec and Ontario the increase in numbers was substantial, a gain of over 200,000 pigs being recorded in the combined total of the two provinces.

Pig numbers, after reaching a peak in 1936, declined through 1937 and 1938 as feed scarcity and high feed prices in relation to pig prices forced reductions. Production has been increasing since the fall of 1938 and this situation was likely to continue through the fall and winter of 1939-40. The fall pig crop of 1939 was expected to be about 32 per cent. greater than the pig crop of a year ago, according to reports of the number of sows expected to farrow from June to November. Large increases were forecast for the Prairie Provinces

Numbers of Pigs on Farms.

	June 1	December 1
1939	4,294,000	...
1938	3,487,000	3,569,000
1937	3,963,000	3,680,000
1936	4,145,000	4,422,000
1935	3,549,000	3,951,000
1934	3,654,000	3,649,000
1933	3,801,000	3,588,000
1932	4,639,000	4,125,000
1931	4,700,000	4,264,000

Poultry. — Hens and chickens on farms were 8.8 per cent greater than at the same date a year ago. Numbers of turkeys showed a gain of 21.4 per cent., having increased from 2,039,600 to 2,476,000.

Numbers of Hens and Chickens on Farms.

	June 1	December 1
1939	58,510,000	...
1938	53,775,000	40,753,000
1937	53,983,000	39,564,000
1936	55,769,000	43,492,000
1935	53,063,000	44,199,000
1934	55,430,000	46,487,000
1933	54,943,000	46,643,000
1932	59,843,000	49,226,000
1931	61,277,000	50,615,000

Intended Farm Slaughtering and Marketings. — Simultaneously with the numbers of livestock on farms at June 1, estimates were compiled of the intended farm slaughtering and marketings during the period from June to November 1939. These estimates are reproduced below with the corresponding figures for 1938. It should be noted that these estimates of intentions to market and of expected production were compiled on June 1 and that changes in factors affecting marketing and breeding since that date may have modified the situation.

*Number of Livestock intended for Farm Slaughter and Market,
June to November, 1939 and 1938.*

	1939	1938	1939 as per cent. of 1938
Cattle	1,496,400	1,362,100	109.9
Sheep	1,082,200	1,050,600	103.0
Pigs	2,209,200	1,779,500	124.1
Hens and Chickens	17,929,600	16,677,100	107.5
Turkeys	1,295,900	1,012,800	128.0

THE LIVESTOCK OUTLOOK IN THE UNITED STATES

In a recent report on the outlook for livestock in the United States in 1940, the Bureau of Agricultural Economics of the Department of Agriculture indicates that relatively large feed crops in the last three years have resulted in a marked recovery in livestock production from the low levels reached following the 1934 drought. Slaughter supplies of livestock, and meat and lard production, in 1940 will be considerably larger than in 1939. Total meat and lard production may be the largest in more than a decade. All the increase over 1939 will be in pork, as little change is expected in the production of beef and lamb.

Consumer demand for meats in 1940 is expected to be stronger than in 1939, in view of the prospects for a substantially higher average of industrial activity and consumer incomes. Foreign demand for pork and lard is also expected to be stronger in 1940 than in 1939.

Livestock numbers on January 1, 1940 were expected to be about 7 or 8 per cent. larger than a year earlier. A large part of the increase is in hogs although a material increase in cattle numbers was also expected. Feed supplies per head of livestock in 1939-40 are not as large as last year but they will be near the pre-drought average.

Feed Situation. — Supplies of feed grains for the 1939-40 feeding season are larger than those available last year and above the pre-drought average. Compared with prospective number of livestock to be fed, the supply per animal unit is slightly smaller than the very large supply of last year but 10 per cent. more than the average supply of the years 1928 to 1932. If the maize seeded

by the Government is deducted, the remaining supply is slightly above the pre-drought average in total quantity and in supply per animal unit. It is expected that a considerable quantity of the 1939 maize will also be sealed and this deduction will bring the available supplies to a level slightly below the 1928-32 average.

Total supplies will be ample to meet the requirements of livestock in practically all parts of the Corn Belt east of the Missouri river but will again be short in drought areas in the western Corn Belt. High yields of maize in the central and eastern Corn Belt and an unusually large carryover are largely responsible for the difference between the present supply and the 1928-32 average. The total production in 1939 of all feed grains, despite a ten per cent. drop in acreage below the average of the years 1928-32, is only slightly less than the production of the five-year period.

Pastures in 1939 did not furnish as much food as in 1938 and the hay crop was about 7 per cent. smaller than that of 1938 but 12 per cent. above the 1933-1937 average. The carryover of hay from 1938 was exceptionally large and the present supply per hay-consuming animal unit is estimated to be the second largest since 1928, being exceeded only by the supply available a year ago. However, the condition of fall pastures was much below average, feeding started early and farm stocks of hay next May are expected to be down to about the usual average in pre-drought years unless the winter is unusually mild.

Beef Cattle. — With abundant supplies of feed grains in the central and eastern Corn Belt and favourable returns from cattle feeding during the past season, the number of cattle fed in the Corn Belt this winter is expected to be larger than in 1938-39. Cattle feeding in the Western States will probably be on a smaller scale, since the poor range and pasture conditions of last summer have resulted in a heavy movement of western cattle eastward, and feed grain supplies in the west are smaller than a year earlier.

Cattle numbers are expected to be about 2 million head larger on January 1, 1940 than a year earlier. Most of the increase during 1939 took place in Minnesota, Iowa and Missouri and in States east of the Mississippi River. In the last-named area, numbers in early 1940 will be the largest on record.

Even if cattle slaughter in 1940 should be no smaller than in 1939, a further increase in cattle numbers is likely to take place, particularly in the Western States if feed conditions in that area show any marked improvement over the relatively poor conditions that prevailed in 1939. With a reduction in slaughter, the increase in cattle numbers probably would be marked, and although numbers on January 1, 1941 would still be below the peak of 1934 they would probably be among the five largest on record.

With cattle numbers at present levels, a total yearly slaughter of 25,000,000 head of cattle and calves can take place without reducing cattle numbers. Such a slaughter is much above the average of the 15 years 1920 to 1934.

Sheep and Lambs. — Indications in November were that the number of lambs fed in the Corn Belt in the 1939-40 feeding season will be materially larger than in the 1938-39 season. The increase in the Corn Belt, however, will be

partly offset by some reduction in the number fed in the Western States. In the Corn Belt area east of the Missouri River, abundant supplies will be an important factor in the increase in lamb feeding. Feed production in the western region was considerably less in 1939 than in 1938.

The number of stock sheep on January 1 in the United States has changed relatively little during the last nine years. The difference between the high and low years during this period has been only about 2,000,000 head or less than 5 per cent. The high year was 1934 and the low year was 1936. Since 1936, numbers increased until on January 1, 1939 they were back to the 1934 peak.

No large increase in the total number of sheep is expected during the next few years. The trend in the Western sheep States, exclusive of Texas, is more likely to be downward than upward in the next few years. Some increase in numbers is probable in Montana and South Dakota and a moderate increase is expected in Texas. Numbers in the native sheep States may also increase moderately during the next few years, especially in districts where the acreage of pasture and hay land is expanding, but an increase of more than one per cent. a year for the next few years seems hardly probable.

Pigs. - Owing to the marked increases in the spring and fall pig crops of 1939 over those of 1938, the number of hogs to be slaughtered in the present marketing year, October 1939-September 1940, will be about 20 per cent. greater than in the preceding year and a little larger than the pre-drought average (1920-1933). It was expected that the combined spring and fall crops of 1939 would total about 83 million head which would be one of the five largest crops on record.

Owing to the favourable feed position, a further increase in the number of pigs raised is expected in 1940 though this increase will not be as large as that of 1939.

The 1939 pig crop was as large as, or larger than, the pre-drought average in all regions, except in the area of the Corn Belt west of the Missouri River. Feed-crop production is again short in this area, and only a moderate increase in number of pigs raised there can be expected in 1940. In most other areas also, it seems probable that only a moderate increase in hog production will occur in 1940, as production in these areas is already at a relatively high level.

THE AUSTRALIAN WOOL CLIP OF 1939-40

Unofficial reports from New South Wales state that sheep are yielding more wool than expected and both the fleece weights and the number of sheep being shorn are considerably greater than last season. The estimate for the Australian clip as a whole, of 3,096,500 bales (approximately 929,000,000 lb.), made in June last by the National Council of Wool Selling Brokers, is now expected by the same body to be exceeded by some 275,000 bales (82,000,000 lb.), making the record total of 3,371,500 bales (approximately 1,011,000,000 lb.).

CURRENT INFORMATION ON LIVESTOCK AND DERIVATIVES.

Hungary. At the middle of January, the condition of livestock was on the whole satisfactory.

Ireland. Milk production in December was up to seasonal levels.

Netherlands. In Groningen, Gelderland, North Holland and South Holland milk production in November was about the same as in November 1938. In Friesland and Drente it was 6 per cent. higher, in Overijsel 10 per cent. higher and in Zeeland 7.5 per cent. higher, and in North Brabant 2 per cent. higher. In Utrecht it was slightly lower.

Switzerland. Unfavourable weather conditions and the mobilization of many agricultural labourers have caused considerable difficulty in tending livestock, with the consequence that there has been a sharp decline in milk deliveries during the last few months, accentuated by the foot and mouth disease epidemic. Deliveries in September were 3.6 per cent. less, in October 8.2 per cent. less and in November 19.8 per cent. less than in the corresponding months of 1938. The decline for November is particularly marked and appears to be due, apart from the causes mentioned above, also to the exceptionally early appearance of snow and the poor quality of the hay. It should however be noted that milk deliveries in November 1938 were 10 per cent. higher than those of November 1937, which in turn were 6.9 per cent. higher than in November 1936. The calving period was also changed, apparently owing to the ravages of epizootis the previous winter, the number of cows recently in calf was small in November, and this factor may have influenced milk yields. It is forecast that milk production will improve during the next few months.

Argentina. The condition of stock in December continued good.

CURRENT INFORMATION ON SERICULTURE.

Production of Fresh Cocoons.

COUNTRIES	QUANTITIES OF EGGS PREPARED FOR INCUBATION					PRODUCTION OF FRESH COCOONS				
	1939	1938	Average 1933 to 1937	% 1939		1939	1938	Average 1933 to 1937	% 1939	
				1938	Average				1938	Average
ooo oz.					ooo lb.					
Bulgaria	...	38	28	...	...	r) 5,071	4,803	3,189	105.6	159.0
France	...	11	15	...	...	...	1,320	1,717	...	...
Greece	...	78	61	...	...	...	7,496	5,797	...	...
Italy	...	343	439	...	...	s) 62,604	44,070	63,969	...	...
Yugoslavia	...	14	20	...	...	...	1,059	1,207	...	...
U. S. S. R.	—	—	—	—	—	...	51,368	39,130	...	...
Cyprus	2	2	2	94.4	131.3	280	331	295	84.6	95.1
Chosen	(s) 206	203	232	101.8	88.8	31,366	36,950	33,705	84.9	93.1
	(f) ...	141	142	...	...	...	21,072	17,706	...	...
Japan	(s) 2,069	2,069	2,536	100.0	81.6	369,733	337,832	379,441	109.4	97.4
	(f) 2,502	2,450	2,987	102.1	83.8	339,690	284,339	346,806	119.5	97.9
Syria and Lebanon.	...	34	38	...	...	r) 4,409	3,318	2,818	132.9	156.5

(s) Spring cocoons — (f) Summer-autumn cocoons. — (x) Unofficial data.

TRADE

COUNTRIES	NOVEMBER				FOUR MONTHS (August 1-November 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Wheat. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Bulgaria	672	0	0	0	1,288	0	0	0	2,097	0
Hungary	2,536	936	0	0	11,572	7,499	0	0	16,316	0
Lithuania	—	87	—	0	(3) 0	139	(3) 0	0	590	0
Poland-Danzig	—	0	—	0	—	191	—	65	734	65
Romania	3,514	4,538	0	0	7,242	10,028	0	0	27,571	0
Yugoslavia	618	230	0	0	3,120	2,263	0	0	3,233	0
U. S. S. R.	—	2,131	—	0	—	17,407	—	0	(6) 18,913	(6) 0
Canada	12,381	13,022	—	31	38,038	39,099	—	475	87,746	935
United States	871	2,936	618	537	6,952	12,828	2,204	1,833	46,050	6,134
Argentina	9,897	2,096	—	—	36,016	9,869	—	—	69,975	—
Chile	—	0	—	0	(3) 1	0	(3) 0	3	0	4
Uruguay	—	20	—	0	(1) 746	285	(1) 0	2	2,232	9
India: by sea	9	11	172	332	84	1,901	233	1,280	1,984	4,421
" by land	—	41	—	11	—	179	—	56	421	132
Iraq	—	40	—	0	—	378	—	0	621	0
Iran	—	0	—	0	(2) 0	0	(2) 0	0	0	0
Manchukuo	—	0	—	1	(3) 0	0	(3) 2	4	0	16
Syria and Lebanon	—	41	—	29	(3) 2	80	(3) 0	178	813	197
Turkey	0	200	—	—	51	553	—	—	1,098	—
Algeria	—	162	—	115	—	483	—	478	(4) 1,346	(4) 943
Egypt	—	0	—	0	(1) 1	1	(1) 9	0	1	60
French Morocco	—	190	—	0	—	1,236	—	0	(4) 2,460	(4) 1
Tunisia	—	91	—	0	(2) 48	284	(2) 5	6	2,273	88
Australia	—	1,122	—	0	(1) 3,549	8,379	(1) 0	0	36,429	0
<i>Importing Countries:</i>										
Germany (7) (8)	—	0	—	3,472	—	0	—	12,815	1	2,002
Austria (7)	—	0	—	778	—	2	—	1,369	3	3,064
Belgo-Luxemb. U. E.	—	254	—	2,902	(1) 126	541	(1) 6,339	9,667	(5) 2,219	(5) 24,891
Bohemia-Moravia (Protectorate) (9)	—	4	—	0	—	37	—	390	498	517
Denmark	0	0	211	347	29	4	890	1,141	40	2,364
Spain	—	—	—	—	—	—	—	—	—	—
Estonia	—	0	—	0	(3) 0	0	(3) 0	11	0	11
Finland	—	0	—	76	(3) 0	0	(3) 20	426	0	668
France	—	602	—	823	—	622	—	3,376	8,347	9,875
Greece	0	—	547	398	0	0	2,626	2,211	0	7,740
Ireland	—	0	—	729	(3) 0	0	(3) 621	3,219	0	10,084
Italy	—	0	—	286	—	26	—	1,793	85	10,112
Latvia	—	0	—	0	(3) 0	0	(3) 0	110	0	295
Norway	0	0	457	306	0	0	1,973	1,494	0	4,002
Netherlands	0	1	1,343	1,288	2	14	4,983	5,704	21	15,623
Portugal	—	0	—	22	(1) 0	0	(1) 52	504	0	1,295
United Kingdom	—	67	—	10,642	(3) 52	705	(3) 12,165	42,079	1,447	130,242
Sweden	—	1	—	266	(2) 2	5	(2) 230	608	189	1,169
Switzerland	0	0	1,290	816	0	0	4,344	3,852	0	10,260
Brazil	—	—	—	1,877	—	—	(2) 1,341	7,305	—	23,148
Colombia	—	—	—	24	—	—	—	131	—	455
Peru	—	0	—	259	(2) 0	0	(2) 644	903	0	2,625
Burma	3	1	4	2	5	1	28	33	7	68
Ceylon	—	—	12	12	—	—	32	31	—	91
China	31	15	67	0	143	99	700	0	511	9,597
Chosen	—	0	—	0	(2) 0	0	(2) 0	22	0	86
Taiwan	—	—	—	0	(1) 0	—	(1) 3	0	—	14
Indochina	—	0	—	0	(1) 0	—	(1) 1	2	0	7
Japan	—	—	—	31	—	—	(2) 78	179	—	679
British Malaya	—	0	—	1	(2) 1	1	(2) 4	5	4	16
Palestine	0	0	146	97	0	0	231	241	0	1,681
Union of South Africa	—	0	—	0	(1) 0	0	(1) 103	1,022	0	1,030
New Zealand	—	0	—	38	(2) 0	0	(2) 207	321	0	2,006
Totals	—	28,839	—	26,548	—	115,139	—	105,544	336,275	307,722

(1) Up to October 31. — (2) Up to September 30. — (3) Up to August 31. — (4) Up to June 30. — (5) Up to March 31. — (6) Up to December 31. — (7) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria. — (8) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (9) Up to March 15, 1939 the data refer to Czecho-Slovakia.

COUNTRIES	NOVEMBER				FOUR MONTHS (August 1-November 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Wheat Flour. — Thousand cents (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Bohemia-Moravia (Protectorate) (7) . . .	...	0	...	0	...	1	...	0	579	6
Bulgaria	0	0	0	0	2	2	0	0	3	0
Spain	—	—	—	—	—	—	—	—	—	—
France	183	172	0	0	599	260	0	313	4,246	859
Hungary	234	82	...	4	640	260	0	0	1,027	0
Italy . . . . .	...	0	...	0	...	640	...	242	1,780	287
Latvia . . . . .	...	0	...	0	(3) 0	0	(3) 0	0	0	0
Lithuania . . . . .	...	0	...	0	(3) 0	11	(3) 0	0	30	0
Poland - Danzig	84	...	...	0	322	...	...	0	846	0
Romania	0	0	0	0	0	0	0	0	2	0
Yugoslavia	6	1	0	0	17	19	0	0	32	0
U. S. S. R. . . . .	...	88	...	0	...	644	...	15	(6) 712	(6) 15
Canada	1,123	937	...	15	3,553	3,161	...	60	9,024	145
United States	1,135	844	2	15	4,932	3,458	93	75	14,057	160
Argentina	237	185	—	—	767	656	—	—	2,048	—
Uruguay . . . . .	...	75	...	0	(1) 122	160	(1) 0	0	385	0
Chosen . . . . .	...	70	...	0	(2) 60	238	(2) 0	0	523	0
India: by sea	145	108	0	0	518	482	1	1	1,172	4
Iraq . . . . .	...	19	...	0	...	64	...	0	153	0
Iran . . . . .	...	0	...	0	(2) 0	0	(2) 0	0	0	0
Japan . . . . .	...	780	...	0	(2) 1,340	2,397	(2) 16	0	4,594	0
Turkey	0	7	—	—	1	18	—	—	75	—
Algeria . . . . .	...	55	...	15	...	198	...	64	(1) 455	(4) 114
French Morocco . . . . .	...	0	...	0	...	0	...	0	(1) 0	(4) 0
Tunisia . . . . .	...	33	...	3	(2) 26	130	(2) 0	49	384	119
Australia . . . . .	...	863	...	0	(1) 3,338	4,672	(1) 0	0	14,767	0
<i>Importing Countries:</i>										
Germany (8) (9) . . . .	...	{ 0 }	...	{ 0 }	...	{ 4 }	...	{ 29 }	174	1,113
Austria (8) . . . . .	...	{ 0 }	...	{ 47 }	...	{ 1 }	...	{ 50 }	(5) 2	(5) 268
Belgo-Luxemb. E. U. . . .	...	4	...	3	(1) 13	31	(1) 39	7	95	40
Denmark	1	2	6	64	19	11	92	219	33	540
Estonia . . . . .	...	0	...	0	(3) 0	0	(3) 0	0	0	0
Finland . . . . .	...	0	...	32	(3) 0	0	(3) 48	261	0	501
Greece	0	0	2	5	0	0	10	12	0	43
Ireland . . . . .	...	0	...	11	(3) 0	0	(3) 5	43	0	121
Norway	0	0	95	177	1	3	249	389	6	820
Netherlands	0	0	301	149	4	2	602	477	5	1,829
Portugal . . . . .	...	0	...	4	(1) 0	0	(1) 9	17	0	38
United Kingdom . . . . .	...	278	...	854	(3) 197	997	(3) 531	2,886	2,269	8,883
Sweden . . . . .	...	0	...	1	(2) 4	2	(2) 2	2	8	8
Haiti . . . . .	...	—	...	15	—	—	(2) 34	52	—	177
Brazil . . . . .	...	—	...	148	—	—	(2) 53	395	—	821
Chile . . . . .	...	0	...	21	(2) 0	0	(2) 16	34	2	93
Colombia . . . . .	...	—	...	2	—	—	(2) ...	7	(4) 24	24
Peru . . . . .	...	0	...	2	(2) 0	0	(2) 6	15	0	42
Burma	0	0	87	47	0	0	260	216	1	865
Ceylon . . . . .	...	62	...	41	—	—	197	140	—	366
China	98	32	166	551	452	32	2,829	2,118	1,176	7,108
Formosa . . . . .	...	0	...	0	(2) 2	0	(2) 0	0	8	0
Netherlands Indies:	...	...	...	114	—	—	(1) 294	415	—	1,271
Java and Madura	...	...	...	69	—	—	(1) 261	250	—	746
Outer Provinces . . . . .	...	...	...	64	(1) 0	0	(1) 101	198	4	719
Indochina . . . . .	...	0	3	115	(2) 27	47	(2) 255	488	134	1,535
British Malaya . . . . .	...	12	...	493	(3) 0	0	(3) 1,184	2,224	0	5,592
Manchukuo . . . . .	...	0	...	38	0	0	171	136	0	415
Palestine	0	...	91	11	(3) 14	15	(3) 6	28	126	111
Syria and Lebanon . . . .	...	0	...	4	(1) 1	0	(1) 12	14	0	46
Egypt . . . . .	...	0	...	1	(1) 2	1	(1) 3	3	2	9
Union of South Africa . . .	...	0	...	0	(2) 0	0	(2) 0	0	0	1
New Zealand . . . . .	...	0	...	0	...	...	...	...	...	...
Totals	—	4,914	—	3,200	—	19,278	—	11,944	60,939	35,854

(1) Up to October 31. — (2) Up to September 30. — (3) Up to August 31. — (4) Up to June 30. — (5) Up to March 31. — (6) Up to December 31. — (7) Up to March 15, 1939 the data refer to Czechoslovakia. — (8) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria. — (9) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia.

COUNTRIES	NOVEMBER				FOUR MONTHS (August 1-November 30)				TWELVE MONTHS (August 1-July 31)	
	NET EXPORTS *		NET IMPORTS **		NET EXPORTS *		NET IMPORTS **		NET EX. *	NET IM. **
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Total Wheat and Flour †. — Thousand centals (1 cental = 100 lb.).										
Germany (7) (8) . . .	—	—	—	3,472	—	—	—	12,847	—	22,254
Austria (7) . . .	—	—	—	846	—	—	—	1,432	—	(5) 3,417
Belgo-Luxemb. E. U. .	—	—	—	2,647	—	—	(1) 6,246	9,093	—	22,599
Bohemia-Moravia: (Protectorate) (9) .	—	4	—	—	—	—	—	385	746	—
Bulgaria . . .	672	0	—	—	1,291	3	—	—	2,101	—
Denmark . . .	—	—	227	429	—	—	960	1,381	—	3,000
Spain . . .	—	—	—	—	—	—	—	—	—	—
Estonia . . .	—	—	—	0	—	—	(3) 0	11	—	12
Finland . . .	—	—	—	118	—	—	(3) 86	774	—	1,335
France . . .	—	—	—	65	—	—	—	2,373	2,988	—
Greece . . .	—	—	550	405	—	—	2,639	2,227	—	7,797
Hungary . . .	2,848	1,166	—	—	12,246	7,847	—	—	17,685	—
Ireland . . .	—	—	—	744	—	—	(3) 627	3,276	—	10,245
Italy . . .	—	—	—	181	—	—	—	1,235	—	8,037
Latvia . . .	—	—	—	0	—	—	(1) 0	110	—	295
Lithuania . . .	—	87	—	—	(3) 0	153	—	—	630	—
Norway . . .	—	—	584	542	—	—	2,303	2,009	—	5,087
Netherlands . . .	—	—	1,744	1,485	—	—	5,780	6,324	—	18,034
Poland-Danzig . . .	—	112	—	—	—	555	—	—	1,797	—
Portugal . . .	—	—	—	28	—	—	(1) 64	526	—	1,345
Romania . . .	3,514	4,541	—	—	7,242	10,028	—	—	27,571	—
United Kingdom . . .	—	—	—	11,343	—	—	(3) 12,559	43,893	—	137,321
Sweden . . .	—	—	—	265	—	—	(2) 224	604	—	980
Switzerland (10) . .	—	—	1,290	816	—	—	4,344	3,852	—	10,259
Yugoslavia . . .	626	231	—	—	3,142	2,289	—	—	3,276	—
Totals Europe . . .	—	6,141	—	23,380	—	20,875	—	92,352	56,794	252,017
U S S R . . .	—	2,249	—	—	—	18,245	—	—	(6) 19,842	—
Canada . . .	13,878	14,220	—	—	42,776	42,759	—	—	98,650	—
United States . . .	1,763	3,504	—	—	11,200	15,502	—	—	28,443	—
Haiti . . .	—	—	—	20	—	—	(2) 45	70	—	236
Argentina . . .	10,213	2,342	—	—	37,038	10,744	—	—	72,705	—
Brazil . . .	—	—	—	2,075	—	—	(2) 1,411	8,031	—	24,044
Chile . . .	—	—	—	28	—	—	(1) 20	49	—	126
Colombia . . .	—	—	—	26	—	—	—	141	—	(4) 487
Peru . . .	—	—	—	262	—	—	(2) 672	922	—	2,681
Uruguay . . .	—	120	—	—	(1) 909	491	—	—	2,736	—
Burma . . .	—	—	116	63	—	—	—	368	319	1,212
Ceylon . . .	—	—	95	66	—	—	—	294	217	579
China . . .	—	—	127	677	—	—	—	3,728	2,683	16,996
Chosen . . .	—	93	—	—	(2) 80	295	—	—	612	—
Taiwan . . .	—	—	—	0	—	—	(2) 0	0	—	3
India: by sea . . .	30	—	—	177	540	1,263	—	—	—	881
„ : by land . . .	—	30	—	—	—	123	—	—	(4) 289	—
Netherlands Indies: Java and Madura . .	—	—	—	151	—	—	(1) 392	553	—	1,695
Outer Provinces . .	—	—	—	92	—	—	(1) 151	334	—	994
Indochina . . .	—	—	—	85	—	—	(1) 131	266	—	960
Iraq . . .	—	65	—	—	—	463	—	—	825	—
Iran . . .	—	—	—	0	—	—	(2) 0	0	—	0
Japan . . .	—	1,010	—	—	(2) 1,687	3,017	—	—	5,445	—
British Malaya . . .	—	—	—	138	—	—	(2) 306	592	—	1,881
Manchukuo . . .	—	—	—	659	—	—	(3) 1,580	2,969	—	7,472
Palestine . . .	—	—	267	149	—	—	—	459	—	2,235
Syria and Lebanon . .	—	—	—	3	(3) 13	—	—	116	636	—
Turkey . . .	0	210	—	—	—	52	—	577	1,198	—
Algeria . . .	—	101	—	—	—	183	—	—	(4) 858	—
Egypt . . .	—	—	—	5	—	—	(1) 24	17	119	—
French Morocco . . .	—	189	—	—	—	1,235	—	—	(4) 2,459	—
Tunisia . . .	—	131	—	—	(2) 76	386	—	—	2,537	—
Union of South Africa .	—	—	—	2	—	—	(1) 104	1,025	—	1,040
Australia . . .	—	2,272	—	—	(1) 8,000	14,609	—	—	56,118	—
New Zealand . . .	—	—	—	38	—	—	(2) 207	321	—	2,007
Totals . . .	—	32,677	—	28,096	—	130,767	—	111,399	380,266	317,546

* Excess of exports over imports. — ** Excess of imports over exports.

† Flour reduced to grain on the basis of the coefficient: 1,000 centals of flour = 1,333-333 centals of grain.

(1) Up to October 31. — (2) Up to September 30. — (3) Up to August 31. — (4) Up to June 30. — (5) Up to March 31. — (6) Up to December 31. — (7) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria. — (8) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel: they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (9) Up to March 15, 1939 the data refer to Czechoslovakia. — (10) Wheat only.

COUNTRIES	NOVEMBER				FOUR MONTHS (August 1-November 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Rye. — Thousand centals (1 cental = 100 lb.).										
Exporting Countries.										
Bulgaria	0	0	0	0	0	0	0	0	0	0
Spain	—	—	—	—	—	—	—	—	—	—
Hungary	58	10	0	0	210	148	0	0	309	0
Latvia . . . . .	...	0	...	0	(3) 0	0 (3)	0	0	142	0
Lithuania . . . . .	...	200	...	0	(3) 0	608 (3)	0	1	1,383	1
Poland-Danzig	—	554	—	0	—	1,005	—	0	8,272	0
Romania	87	11	0	0	507	30	0	0	640	0
Yugoslavia	0	0	0	0	0	0	0	0	0	0
U. S. S. R. . . . .	...	536	...	0	...	2,635	.	0 (6)	3 424 (b)	0
Canada	619	142	..	0	1,241	469	.	0	984	0
United States	0	11	0	0	0	374	0	0	374	0
Argentina	593	7	—	—	1,461	40	—	—	2,064	—
Turkey	0	0	—	—	26	3	—	—	177	—
Algeria . . . . .	...	1	...	0	.	10	..	0 (4)	36 (4)	0
Importing Countries										
Germany (7) (8) . . . . .	..	0	...	244	..	2	..	409	45	3,218
Austria (7) . . . . .	..	0	...	...	..	2	..	92 (5)	3 (5)	110
Belgo-Luxemb E U . . . . .	..	8	...	506 (1)	0	10 (1)	771	1,757	32	6,863
Bohemia-Moravia (Protectorate) (9) . . . . .	..	0	...	0	...	0	...	524	110	532
Denmark	0	0	123	227	0	1	658	675	1	2 061
Estonia . . . . .	...	0	...	0 (3)	29	120 (3)	0	118	218	182
Finland . . . . .	...	0	...	2 (3)	0	0 (3)	24	240	0	329
France . . . . .	...	0	.	1	...	0	.	9	0	32
Greece	0	0	0	0	0	0	0	0	0	0
Italy . . . . .	...	0	...	152	...	0	..	207	0	1,379
Norway	0	0	486	169	0	0	1,250	1,087	0	2 734
Netherlands	0	141	32	14	1	354	193	265	976	1,649
United Kingdom . . . . .	...	0	...	27	...	2	..	62	2	113
Sweden	0	0	...	12 (2)	0	0 (2)	8	61	1	99
Switzerland	0	0	9	45	0	0	58	182	0	289
Palestine	—	—	90	20	—	—	130	58	—	188
Totals	—	1,613	—	1,419	—	5,813	—	5,747	19,193	19,779

(1) Up to October 31 — (2) Up to September 30 — (3) Up to August 31 — (4) Up to June 30 — (5) Up to March 31. — (6) Up to December 31 — (7) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria — (8) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (9) Up to March 15, 1939 the data refer to Czecho-Slovakia.

COUNTRIES	NOVEMBER				FOUR MONTHS (August 1-November 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Barley. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Bohemia-Moravia (Protector.) (7) . .	...	248	...	0	...	401	...	0	1,260	60
Bulgaria	0	0	0	0	0	0	0	0	0	0
Denmark	11	421	0	0	239	1,017	12	9	3,002	21
Spain	—	—	—	—	—	—	—	—	—	—
Hungary	54	22	0	0	80	32	0	0	107	0
Latvia . . . . .	...	0	...	0	(3) 0	0	(3) 0	0	97	0
Lithuania . . . . .	...	61	...	0	(3) 0	74	(3) 0	0	318	0
Poland - Danzig . .	—	503	—	0	—	1,369	—	0	5,846	0
Romania	87	224	0	0	2,220	2,093	0	0	4,195	0
Sweden . . . . .	...	0	...	0	(2) 0	0	(2) 0	0	2	0
Yugoslavia	0	0	2	0	3	0	9	8	1	21
U. S. S. R. . . . .	...	799	...	0	...	7,035	...	0	(6) 7,039	(6) 0
Canada	1,490	1,635	...	0	3,842	4,508	...	1	7,919	1
United States	5	349	0	0	1,090	3,434	121	0	5,041	237
Argentina	301	84	—	—	884	228	—	—	4,644	—
Chile . . . . .	...	6	—	—	(2) 53	281	—	—	1,076	—
India: by sea	0	1	15	5	2	33	125	19	39	79
Iraq . . . . .	...	254	...	0	...	1,398	...	0	4,573	0
Iran . . . . .	...	0	...	0	(2) 33	22	(2) 0	0	97	0
Manchukuo . . . . .	...	0	—	—	...	1	—	—	5	—
Syria and Lebanon . .	...	71	...	0	(3) 123	397	(3) 0	1	1,019	17
Turkey	0	122	—	—	156	1,309	—	—	2,740	—
Algeria . . . . .	...	1	...	16	...	156	...	20	(4) 254	(4) 199
Egypt . . . . .	...	0	...	2	(1) 0	62	(1) 0	4	68	19
French Morocco . . .	...	19	...	0	...	448	...	0	(4) 1,649	(4) 0
Union of South Afr . .	...	0	...	0	(1) 0	0	(1) 0	0	0	0
Australia . . . . .	...	2	...	0	(1) 245	71	(1) 0	0	1,545	0
<i>Importing Countries:</i>										
Germany (8) (9) . .	...	0	...	1,257	...	0	...	3,514	1	9,208
Austria (8) . . . .	...	0	...	169	...	...	...	355	(5) 0	(5) 713
Belgo-Luxemb. E. U. .	...	15	...	814	(1) 2	107	(1) 1,384	4,187	217	10,406
Estonia . . . . .	...	0	...	0	(1) 0	0	(3) 0	4	0	4
Finland . . . . .	...	0	...	0	(3) 0	0	(1) 0	0	0	0
France . . . . .	...	2	...	102	...	4	...	625	62	1,545
Greece	0	0	14	76	0	0	35	96	0	344
Ireland . . . . .	...	0	...	2	(3) 0	0	(3) 0	61	0	518
Italy . . . . .	...	2	...	77	...	8	...	133	34	967
Norway	0	0	104	40	0	0	222	155	0	415
Netherlands	0	76	132	200	2	412	912	2,114	848	4,855
United Kingdom . . .	...	0	...	2,283	(1) 0	2	(3) 1,401	10,515	4	21,213
Switzerland	0	0	534	195	0	0	1,289	1,351	0	3,448
Burma	—	—	0	0	—	—	2	2	—	4
Ceylon	—	—	1	2	—	—	3	5	—	11
Chosen . . . . .	...	0	...	0	(2) 0	0	(1) 0	0	0	2
Indochina . . . . .	...	0	...	0	(1) 0	0	(1) 0	0	0	1
Japan	—	—	...	0	—	—	(2) 0	0	—	0
Palestine	0	0	0	11	0	6	19	126	6	304
Tunisia . . . . .	...	1	...	1	(2) 218	2	(2) 4	122	220	140
New Zealand . . . . .	...	0	...	2	(2) 0	0	(2) 53	8	0	197
Totals	—	4,918	—	5,254	—	24,910	—	23,435	53,929	54,949

(1) Up to October 31. — (2) Up to September 30. — (3) Up to August 31. — (4) Up to June 30. (5) Up to March 31. —
 (6) Up to December 31. — (7) Up to March 15, 1939, the data refer to Czechoslovakia. — (8) From January 1, 1938 to
 March 31, 1939, excluding trade between Germany and Austria. — (9) As from April 1, 1939 the data refer to the territory
 of the former Reich, Ostmark, the Sudetenland and Memel; they do not include trade between these territories and the Protectorate
 of Bohemia-Moravia.

COUNTRIES	NOVEMBER				FOUR MONTHS (August 1-November 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Oats. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Bohemia-Moravia (Protectorate) (7) . . .	...	0	...	0	...	10	...	0	582	2
Bulgaria	0	0	0	0	0	0	0	0	0	0
Hungary	0	0	0	0	0	0	0	0	0	0
Lithuania . . . . .	...	75	...	0	(3)	103	(3)	0	604	0
Poland-Danzig	—	0	—	0	—	0	—	0	577	0
Romania	0	0	0	0	0	0	0	0	0	0
Yugoslavia	0	0	0	0	0	0	0	0	0	0
U. S. S. R. . . . .	...	2	...	0	...	13	...	0	(6) 14	(6) 0
Canada	707	384	...	157	1,457	1,041	...	781	3,265	1,134
United States	4	423	278	1	13	1,042	688	1	1,193	427
Argentina	921	257	—	—	2,501	1,565	—	—	5,957	—
Chile . . . . .	...	24	—	—	(2) 146	146	—	—	1,119	0
Chosen . . . . .	...	0	...	0	(2) 0	0	(2) 0	0	1	0
India: by sea	0	2	—	—	5	10	—	—	42	—
Turkey	0	12	—	—	6	127	—	—	231	—
French Morocco . . .	...	44	...	0	...	284	...	0	(4) 486	(4) 0
Tunisia . . . . .	...	3	...	0	(2) 56	56	(2) 0	0	187	0
Union of South Afr. .	...	0	...	0	(1) 3	1	(1) 0	0	5	2
Australia . . . . .	...	2	...	0	(1) 25	13	(1) 0	0	41	3
New Zealand . . . .	...	0	...	0	(2) 0	0	(2) 2	2	4	5
<i>Importing Countries:</i>										
Germany (8) (9) . .	...	0	...	316	...	0	...	972	1	1,725
Austria (8) . . . .	...	0	...	0	...	0	...	201	(5) 0	(5) 620
Belgo-Luxemb. E. U. .	...	0	...	2	(1) 0	0	(1) 31	91	1	655
Denmark	0	19	0	0	0	40	0	94	184	101
Estonia . . . . .	...	0	...	0	(3) 0	0	(3) 0	0	0	3
Finland . . . . .	...	0	...	0	(3) 0	0	(3) 3	20	0	20
France . . . . .	...	1	...	14	...	6	...	115	12	307
Greece	0	0	0	0	0	0	165	0	0	0
Ireland . . . . .	...	0	...	0	(3) 0	3	(3) 0	0	3	0
Italy . . . . .	...	0	...	0	...	4	...	6	5	153
Latvia . . . . .	...	0	...	0	(3) 0	0	(3) 0	0	238	1
Norway	0	0	4	0	0	0	4	0	0	2
Netherlands	0	3	78	28	0	32	468	354	379	1,221
United Kingdom . .	...	1	...	290	(3) 0	2	(3) 164	743	27	2,073
Sweden . . . . .	...	0	...	2	(2) 0	0	(2) 19	26	47	40
Switzerland	0	0	359	179	0	0	1,144	1,131	0	4,977
Peru	—	—	...	1	—	—	(2) 3	11	—	26
Ceylon	—	—	0	1	—	—	6	6	—	17
Indochina . . . . .	...	0	...	0	(1) 0	0	(1) 0	0	0	0
Japan	—	—	...	0	—	—	(2) 0	0	—	0
Syria and Lebanon . .	...	0	...	0	(3) 1	2	(3) 0	2	3	2
Algeria . . . . .	...	1	...	41	...	5	...	324	(4) 15	(4) 467
Egypt	—	—	...	0	—	—	(1) 0	0	—	1
Totals	—	1,252	—	1,032	—	4,505	—	4,880	15,203	13,984

(1) Up to October 31. — (2) Up to September 30 — (3) Up to August 31. — (4) Up to June 30. — (5) Up to March 31. — (6) Up to December 31. — (7) Up to March 15 1939, the data refer to Czecho-Slovakia. — (8) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria — (9) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel, they do not include trade between these territories and the Protectorate of Bohemia-Moravia.

COUNTRIES	NOVEMBER				TWELVE MONTHS (November 1-October 31)				TWELVE MONTHS (Nov. 1-Oct. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1938-39	1937-38	1938-39	1937-38	1937-38	1937-38
Maize. — Thousand cents (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Bulgaria	0	0	0	0	22	1,394	0	0	—	—
Hungary	0	0	0	0	1,038	4,223	0	226	—	—
Romania	384	1,127	0	0	12,014	2,834	0	0	—	—
Yugoslavia	2	101	0	0	2,334	13,850	0	0	—	—
U. S. S. R. . . . .	...	308	...	0	(6) 836	0	(6) 0	0	—	—
United States	674	3,361	37	20	19,673	80,298	253	365	—	—
Haiti . . . . .	...	0	—	—	(1) 5	5	—	—	—	—
Dominican Republic . . . . .	...	31	—	—	340	264	—	—	—	—
Argentina	3,816	7,119	...	—	74,796	66,135	1	—	—	—
Brazil . . . . .	...	126	—	—	(1) 1,579	2,677	—	—	—	—
Burma . . . . .	...	3	—	—	397	276	—	—	—	—
China	0	15	—	—	26	0	—	—	—	—
India: by sea	0	0	—	—	1	2	—	—	—	—
Netherlands Indies:										
Java and Madura	4	9	—	—	1,353	1,209	—	—	—	—
Outer Provinces . . . . .	...	43	—	—	813	1,023	—	—	—	—
Indochina	1,511	1,543	—	—	10,037	12,554	—	—	—	—
Iraq . . . . .	...	0	—	—	(1) 2	20	—	—	—	—
Manchukuo . . . . .	...	375	—	—	(2) 6,134	5,146	—	—	—	—
Syria and Lebanon . . . . .	...	1	...	0	(2) 76	18	(2) 9	1	—	—
Egypt . . . . .	...	1	...	0	2	7	—	114	—	—
Madagascar . . . . .	...	8	...	0	(3) 627	1,180	(3) 0	0	—	—
French Morocco . . . . .	...	0	...	0	(4) 46	0	(1) 0	479	—	—
Union of South Afr	1,354	707	...	2	12,752	6,593	10	9	—	—
<i>Importing Countries:</i>										
Germany (7) (8) . . . . .	...	0	...	1,627	(3) 0	0	(3) 7,531	53,440	—	—
Austria (7) . . . . .	...	0	...	446	(5) 0	0	(5) 2,364	6,746	—	—
Belgo-Luxemb. F. U. . . . .	...	45	...	1,057	345	639	12,188	14,891	—	—
Bohemia-Moravia (Protectorate) (9) . . . . .	...	0	...	75	(3) 0	198	(3) 966	1,072	—	—
Denmark	0	0	212	118	1	6	2,911	8,129	—	—
Spain	—	—	—	—	—	—	—	—	—	—
Estonia . . . . .	...	0	...	0	(2) 0	0	(2) 1	62	—	—
Finland . . . . .	...	0	...	258	(2) 0	0	(2) 619	1,497	—	—
France . . . . .	...	0	...	1,969	(3) 14	14	(3) 10,663	16,785	—	—
Greece	0	0	0	119	0	0	1,336	1,004	—	—
Ireland . . . . .	...	0	...	726	(2) 0	0	(2) 7,908	7,616	—	—
Italy . . . . .	...	0	...	115	(3) 34	2	(3) 1,637	1,137	—	—
Latvia . . . . .	...	0	...	0	(2) 0	0	(2) 0	0	—	—
Norway	0	0	447	188	0	5	2,647	3,537	—	—
Netherlands	0	0	1,600	1,681	2	15,968	21,060	—	—	—
Poland-Danzig . . . . .	...	0	...	0	(3) 0	0	(3) 0	60	—	—
Portugal . . . . .	...	0	...	208	0	0	864	1,223	—	—
United Kingdom . . . . .	...	297	...	6,375	(2) 2,606	2,790	(2) 51,756	71,039	—	—
Sweden . . . . .	...	0	...	81	(1) 0	0	(1) 967	4,166	—	—
Switzerland	0	0	356	145	0	0	2,385	2,306	—	—
Canada	0	0	...	774	3	2	(3) 3,053	3,811	—	—
Peru . . . . .	...	0	...	0	(1) 0	1	(1) 0	3	—	—
Chosen . . . . .	...	3	...	0	(1) 113	102	(1) 352	22	—	—
Japan . . . . .	...	—	...	396	—	—	(2) 5,866	5,451	—	—
Palestine	0	0	12	16	0	29	160	127	—	—
Algeria . . . . .	...	0	...	65	(4) 39	8	(4) 95	41	—	—
Tunisia . . . . .	...	0	...	115	(1) 0	0	(1) 153	222	—	—
Australia . . . . .	...	0	...	0	0	158	0	27	—	—
New Zealand . . . . .	...	0	...	0	(1) 0	0	(1) 56	2	—	—
Totals	—	15,223	—	16,576	—	203,670	—	226,670	—	—

(1) Up to September 30. — (2) Up to August 31. — (3) Up to July 31. — (4) Up to June 30. — (5) Up to March 31. — (6) Up to December 31. — (7) From January 1, 1938 to March 31, 1939 excluding trade between Germany and Austria. — (8) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (9) Up to March 15, 1939, the data refer to Czechoslovakia.

COUNTRIES	NOVEMBER				ELEVEN MONTHS (January 1-November 30)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938	1938
Rice. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Spain	—	—	—	2	—	—	—	—	—	—
Italy	—	286	—	—	(4)	2,197	2,967	(4)	1	3,497
United States	92	230	60	37	—	2,978	2,952	—	677	538
Brazil	—	128	—	—	(2)	991	1,156	—	—	1,236
Burma	2,836	2,786	2	2	—	72,269	59,657	—	24	25
Chosen	—	111	—	0	(2)	2,138	897	(2)	0	0
Taiwan	—	3	—	0	(2)	255	219	(2)	0	0
Indochina	1,782	1,354	—	34	—	32,020	21,190	(1)	188	241
Iraq	—	0	—	0	(4)	10	88	(4)	1	0
Iran	—	0	—	1	(2)	0	795	(2)	13	11
Thailand (Siam)	2,972	2,385	—	—	—	37,315	30,016	—	—	—
Egypt	—	286	—	0	(1)	1,678	959	(1)	2	201
Madagascar	—	14	—	0	(4)	96	233	(4)	0	0
Australia	—	23	—	1	(1)	279	256	(1)	37	25
<i>Importing Countries:</i>										
Germany (7) (8)	—	51	—	382	(4)	201	466	(4)	4,161	5,424
Austria (7)	—	0	—	9	(6)	0	0	(6)	155	470
Belgo-Luxemb. E. U.	—	19	—	66	(1)	365	307	(1)	1,446	1,456
Bohemia-Moravia (Protectorate) (9)	—	0	—	28	(4)	0	0	(4)	305	913
Denmark	0	2	15	76	—	1	2	—	145	275
Estonia	—	—	—	1	—	—	—	(3)	19	23
Finland	—	—	—	2	—	—	—	(3)	185	296
France	—	112	—	470	(4)	68	324	(4)	7,552	12,915
Greece	0	0	4	58	—	0	0	—	545	577
Hungary	0	0	36	74	—	0	0	—	445	306
Ireland	—	0	—	4	(3)	0	0	(3)	57	64
Latvia	—	0	—	2	(3)	0	0	(3)	23	20
Lithuania	—	0	—	0	(3)	0	0	(3)	7	11
Norway	0	0	11	4	—	5	0	—	115	90
Netherlands	35	134	106	70	—	1,602	1,846	—	5,037	3,687
Poland-Danzig	—	3	—	0	(4)	13	124	(4)	394	1,064
Portugal	—	1	—	2	(1)	0	1	(1)	73	60
Romania	—	—	6	50	—	—	—	—	348	424
United Kingdom	—	8	—	282	(3)	70	84	(3)	2,517	2,815
Sweden	—	—	—	15	—	—	—	(2)	228	246
Switzerland	0	0	104	45	—	0	0	—	642	462
Yugoslavia	0	0	56	67	—	0	0	—	339	408
U. S. S. R.	—	4	—	0	—	—	34	—	—	881
Canada	—	1	—	66	(4)	21	7	(4)	606	566
Haiti	—	—	—	1	—	—	—	(2)	10	17
Argentina	0	1	—	155	—	2	1	(1)	648	1,073
Chile	—	—	—	14	—	—	—	(2)	183	232
Colombia	—	—	—	13	—	—	—	(5)	210	238
Peru	—	0	—	172	(2)	2	0	(2)	339	691
Ceylon	0	0	883	701	—	2	2	—	12,640	11,216
China	3	2	100	81	—	154	9	—	6,194	8,825
India: by sea	490	385	2,704	1,482	—	5,995	5,617	—	49,460	22,913
: by land	—	40	—	126	(4)	280	425	(4)	1,247	1,635
Netherlands Indies:	—	—	—	—	—	—	—	—	—	—
Java and Madura	3	29	—	3	—	259	177	(1)	515	89
Outer Provinces	—	20	—	588	(1)	198	168	(1)	4,914	6,141
Japan	—	37	—	30	(2)	355	147	(2)	381	398
British Malaya	—	385	—	1,363	(2)	2,940	4,076	(2)	15,436	17,252
Manchukuo	—	1	—	75	(3)	4	303	(3)	1,373	1,126
Palestine	4	14	49	65	—	82	101	—	522	438
Syria and Lebanon	—	0	—	41	(3)	0	0	(3)	294	336
Algeria	—	0	—	228	(5)	79	31	(5)	232	875
French Morocco	—	—	—	16	—	—	—	(5)	71	228
Tunisia	—	0	—	3	(2)	0	1	(2)	9	496
Union of South Afr.	—	0	—	131	(1)	0	0	(1)	1,377	1,206
New Zealand	—	0	—	2	(2)	0	0	(2)	59	61
Totals	—	8,855	—	7,140	—	135,638	—	109,984	145,324	117,354

(1) Up to October 31. — (2) Up to September 30. — (3) Up to August 31. — (4) Up to July 31. — (5) Up to June 30. — (6) Up to March 31. — (7) From January 1, 1938, to March 15, 1939, excluding trade between Germany and Austria. — (8) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (9) Up to March 15, 1939, the data refer to Czechoslovakia.

COUNTRIES	NOVEMBER				ELEVEN MONTHS (January 1 November 30)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938	1938
Linseed. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Latvia . . . . .	...	13	...	1	(3) 66	57	(3) 24	10	74	17
Lithuania . . . . .	...	11	...	0	(3) 155	65	(3) 0	0	125	0
Romania	1	0	0	0	3	0	2	5	0	5
Argentina	962	2,173	—	—	24,511	24,061	—	—	27,866	—
Uruguay . . . . .	...	89	—	—	(2) 2,186	1,475	—	—	1,595	—
China	1	2	—	—	91	160	—	—	160	—
India by sea	298	444	0	0	5 798	6,003	0	1	6,408	1
" by land	—	—	—	18	—	—	(4) 143	290	—	326
Iraq . . . . .	...	10	—	—	(4) 17	69	—	—	82	—
Manchukuo . . . . .	...	3	—	—	(3) 61	18	—	—	18	—
Egypt	0	0	0	0	(1) 2	2	(1) 1	6	4	6
French Morocco	6	—	—	—	(5) 39	122	—	—	127	—
Tunisia . . . . .	...	0	...	0	(2) 2	0	(2) 0	0	0	0
New Zealand . . . . .	...	0	...	0	(2) 0	0	(2) 0	0	0	0
<i>Importing Countries</i>										
Germany (7) (8) . . . . .	...	0	...	199	(4) 0	0	(4) 2,417	3,087	0	3,418
Austria (7) . . . . .	...	0	...	0	(6) 0	0	(6) 2	4	0	4
Belgo Luxemb E U . . . . .	..	7	..	113	(1) 97	87	(1) 1,928	1,653	93	1,886
Bohemia Moravia (Protectorate) (9) . . . . .	..	0	...	14	(4) 0	0	(4) 188	364	0	385
Denmark	0	0	33	11	0	1	567	343	1	372
Spain	—	—	—	—	—	—	—	—	—	—
Estonia . . . . .	...	0	..	0	(3) 3	5	(3) 0	0	5	0
Finland . . . . .	..	0	..	17	(3) 0	0	(3) 113	165	0	177
France . . . . .	...	0	...	251	(4) 2	1	(4) 2,744	4,265	2	4,480
Greece	0	0	0	12	0	0	71	72	0	75
Hungary	0	0	0	0	0	0	33	65	0	65
Ireland . . . . .	..	0	...	2	(3) 0	0	(3) 130	128	0	139
Italy . . . . .	..	0	..	75	(4) 0	0	(4) 760	1,106	0	1,160
Norway	0	0	50	31	0	0	504	431	0	463
Netherlands	0	3	324	639	129	111	6,426	6,119	124	6,572
Poland-Danzig	—	0	—	0	(4) 0	0	(4) 38	0	0	0
Portugal . . . . .	...	—	..	0	—	—	(1) 94	106	—	152
United Kingdom . . . . .	...	0	...	545	(3) 0	0	(3) 4,477	5,894	0	6,191
Sweden . . . . .	..	—	...	115	—	—	(2) 946	1,032	—	1,074
Yugoslavia	0	0	0	7	0	0	157	190	0	216
Canada	0	1	..	6	6	6	(4) 335	394	7	399
United States	—	—	382	877	—	—	8,627	7,778	—	8,604
Burma	0	0	0	0	0	0	0	0	0	0
Japan . . . . .	...	0	...	6	(2) 0	2	(2) 39	177	2	177
Palestine	—	—	7	0	—	—	24	14	—	14
Algeria . . . . .	...	0	..	0	(5) 0	0	(5) 0	1	0	1
Australia . . . . .	...	0	...	104	(1) 0	0	(1) 458	702	0	725
Totals	—	2,762	—	3,043	—	32,245	—	34,407	36,713	37,104

(1) Up to October 31 — (2) Up to September 30 — (3) Up to August 31 — (4) Up to July 31 — (5) Up to June 30 — (6) Up to March 31. — (7) From January 1, 1938 to March 31, 1939 excluding trade between Germany and Austria — (8) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel, they do not include trade between these territories and the Protectorate of Bohemia-Moravia — (9) Up to March 15 1939 the data refer to Czechoslovakia.

COUNTRIES	NOVEMBER				FOUR MONTHS (August 1-November 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Exporting Countries:										
United States . . .	3,053	2,538	53	72	12,374	8,146	238	271	17,564	749
Haiti	0	0	—	—	(2) 0	2	—	—	104	—
Dominican Republic . . .	0	0	—	—	(1) 0	1	—	—	5	—
Argentina	3	43	—	—	167	310	(1) 0	0	555	0
Brazil	410	—	—	—	(2) 356	2,057	—	—	7,692	—
Peru	219	—	—	—	(2) 390	804	—	—	1,801	—
Burma	53	58	0	0	87	112	0	0	385	0
China	7	186	216	39	38	994	1,662	119	1,305	3,698
India: by sea . . .	513	817	212	84	2,529	2,844	559	522	12,896	1,684
Netherlands Indies:										
Java and Madura . . .	0	2	—	—	1	2	—	—	19	—
Outer provinces . . .	3	—	—	—	(1) 4	4	—	—	19	—
Iraq	8	—	—	0	—	24	—	1	53	2
Iran	24	—	—	0	(2) 104	49	(2) 0	0	223	0
Syria and Lebanon . . .	1	—	—	0	(1) 1	8	(1) 0	0	55	1
Turkey	9	91	—	—	25	210	—	—	385	—
Egypt	730	—	—	(1) 2,014	2,422	—	—	—	8,429	—
French Morocco . . .	0	—	—	0	—	0	—	0	(4) 2	(4) 1
Importing Countries:										
Germany (7) (8) . . .	0	—	—	437	—	0	—	2,351	1	6,399
Austria (7)	0	—	—	75	—	—	—	300	(5) 0	(5) 527
Belgo-Luxemb. E. U. . .	66	—	—	237	(1) 108	290	(1) 336	814	906	2,335
Bohemia-Moravia (Protectorate) (9) . . .	0	—	—	106	—	6	—	388	10	1,226
Bulgaria	0	—	2	23	—	0	31	88	0	294
Denmark	0	—	30	26	0	0	51	61	—	202
Spain	—	—	—	—	—	—	—	—	—	—
Estonia	0	—	—	13	(1) 0	0	(3) 13	48	0	150
Finland	0	—	—	30	(1) 0	0	(3) 14	98	0	361
France	37	—	—	636	—	104	—	2,025	514	5,765
Greece	0	—	3	3	—	0	—	12	0	49
Hungary	0	—	38	72	0	0	159	199	0	629
Italy	0	—	—	281	—	0	—	1,014	0	2,742
Latvia	0	—	—	7	(1) 0	0	(3) 13	33	0	103
Lithuania	0	—	—	4	(1) 0	0	(3) 1	18	0	37
Norway	0	—	15	12	—	0	30	31	0	88
Netherlands	1	—	251	109	2	4	489	416	12	1,203
Poland - Danzig . . .	—	—	—	140	—	1	—	595	—	1,681
Portugal	—	—	—	61	—	(1) 66	—	109	—	474
Romania	0	—	9	58	—	0	70	173	—	433
United Kingdom . . .	42	—	—	880	(1) 34	174	(1) 655	3,456	555	10,509
Sweden	—	—	—	103	—	(2) 67	—	231	—	920
Switzerland	0	—	181	38	—	0	385	179	0	661
Yugoslavia	0	—	31	67	—	0	110	187	0	515
U. S. S. R.	—	—	—	2	—	—	—	10	(6) 88	(6) 13
Canada	—	—	—	214	—	—	—	537	—	1,269
Colombia	—	—	—	13	—	—	—	29	—	(4) 112
Ceylon	0	—	0	3	—	0	12	7	0	17
Chosen	—	—	—	45	(2) 0	0	(2) 49	86	0	348
Taiwan	—	—	—	0	—	—	(2) 0	0	—	1
Indochina	—	—	—	0	(1) 2	2	(1) 44	18	5	601
Japan	—	—	—	1,057	(2) 0	1	(2) 2,269	4,250	1	13,176
Manchukuo	—	—	—	168	(3) 0	0	(3) 34	476	0	682
Palestine	1	—	3	1	—	0	9	4	0	16
Algeria	—	—	—	0	—	—	—	2	(4) 1	(4) 4
Union of South Afr. . .	—	—	—	0	(1) 0	3	(1) 5	6	3	13
Australia	—	—	—	15	(1) 0	0	(1) 33	52	0	121
Totals	—	5,278	—	5,131	—	18,574	—	19,216	53,590	59,811

(1) Up to October 31 — (2) Up to September 30 — (3) Up to August 31. — (4) Up to June 30. — (5) Up to March 31. — (6) Up to December 31. — (7) From January 1, 1938 to March 31, 1939 excluding trade between Germany and Austria. — (8) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (9) Up to March 15, 1939 the data refer to Czechoslovakia.

COUNTRIES	NOVEMBER				THREE MONTHS (September 1-November 30)				TWELVE MONTHS (Sept. 1-Aug. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Wool. — Thousand lb.										
<i>Exporting Countries:</i>										
Ireland . . . . .	...	1,876	...	86	...	4,502	...	183	16,892	963
Argentina	(a) 13,060	29,218	...	...	...	29,083	...	...	299,162	...
(b) 7,258	6,418	...	...	...	...	14,835	...	...	56,747	...
Chile . . . . .	...	35	...	71	(a) 110	311	(a) 26	251	30,838	461
Peru . . . . .	...	1,001	...	...	(a) 825	2,672	...	...	12,020	...
Uruguay	(a) 6,867	...	...	...	(a) 12,086	18,563	...	...	95,934	...
(b) 1,427	...	...	...	...	(a) 4,182	4,251	...	...	24,441	...
Burma	24	15	0	0	...	82	0	0	311	0
China	108	602	...	...	...	214	...	...	6,671	...
India: by sea	5,038	6,667	439	392	...	15,913	1,142	1,550	76,990	8,031
" : by land . . . . .	...	...	...	1,733	...	...	...	4,068	...	(3) 19,194
Iraq . . . . .	...	1,530	...	0	...	5,199	...	...	(3) 17,238	(3) 57
Iran . . . . .	...	18	...	0	(a) 119	712	(a) 0	0	6,151	0
Manchukuo . . . . .	...	401	...	0	...	899	...	0	3,567	295
Palestine	0	15	0	11	9	26	4	11	181	40
Syria and Lebanon . . . . .	...	176	...	0	...	2,247	...	134	8,622	423
Turkey	(a) 1,470	2,681	...	...	...	7,366	...	...	21,272	...
Algeria . . . . .	...	1,986	...	106	...	4,325	...	661	(4) 16,484	(4) 2,410
Egypt . . . . .	...	293	...	60	(a) 886	1,373	(a) 35	110	5,176	465
French Morocco . . . . .	...	952	...	0	...	3,060	...	9	(4) 10,717	(4) 40
Tunisia . . . . .	...	247	...	2	(a) 569	(a) 0	...	29	2,172	218
Un of S Africa	(a) 14,872	38,173	...	280	21,808	60,407	...	425	197,226	1,058
(b) 787	586	...	88	2,158	1,292	...	...	368	7,994	1,587
Australia	(a) 120,666	...	326	(a) 23,552	256,685	(a) 1,078	1,232	799,315	15,655	...
(b) 7,855	...	46	(a) 3,783	18,356	(a) 66	123	...	68,809	604	...
New Zealand	(a) 3,417	...	15	(a) 4,901	8,865	...	20	254,591	55	...
(b) 2,604	...	0	(a) 3,468	8,523	...	4	...	57,270	4	...
<i>Importing Countries:</i>										
Germany (a) (7)	(a) 0	...	7,419	...	2	...	24,948	(a) 24	(a) 245,898	...
(b) 0	...	2,826	...	...	0	...	8,457	(a) 7	(a) 27,569	...
Austria (b) . . . . .	...	2,288	...	...	31	...	4,171	(a) 31	(a) 12,610	...
Belux-Luxemb. (a) . . . . .	...	2,930	...	9,193	(a) 5,571	10,291	(a) 2,619	28,232	57,576	220,450
Econ. Un (b) . . . . .	...	2,643	...	331	(a) 5,146	7,923	(a) 243	1,168	32,653	7,500
Bohemia-Moravia (Protectorate) (8) . . . . .	...	4	...	1,144	...	29	...	3,058	(a) 395	(a) 13,722
Bulgaria	0	53	66	53	0	...	203	251	0	1,790
Denmark	68	31	110	650	97	79	822	1,865	419	8,774
Spain . . . . .	...	...	...	...	...	...	...	...	...	...
Estonia . . . . .	...	0	...	84	...	0	...	218	0	937
Finland . . . . .	...	22	...	287	...	24	...	1,583	112	6,420
France . . . . .	...	4,874	...	22,869	...	12,893	...	56,379	(a) 58,076	(a) 409,133
Greece	46	196	101	328	95	547	977	1,127	2,103	7,657
Hungary	0	55	185	0	99	262	...	434	1,027	3,208
Italy	(a) 29	...	5,157	...	49	...	17,783	(a) 1,047	(a) 61,489	...
(b) 130	...	284	...	...	516	...	1,175	(a) 1,389	(a) 4,385	...
Latvia . . . . .	...	0	...	220	...	0	...	511	0	2,101
Lithuania . . . . .	...	0	...	95	...	0	...	238	0	1,001
Norway	130	146	137	196	225	397	397	783	1,689	2,668
Netherlands	(a) 46	161	1,290	939	51	258	2,952	2,332	3,166	11,572
(b) 2	24	1,096	1,060	9	64	3,931	2,923	756	12,225	...
Poland - Danzig . . . . .	...	0	...	4,661	...	0	...	12,247	(a) 4	(a) 56,838
Portugal . . . . .	...	88	...	75	(a) 1,444	170	(a) 459	359	2,251	3,318
Romania	0	0	15	157	0	18	73	353	62	840
United Kingdom . . . . .	...	22,075	...	68,650	...	50,182	...	150,537	287,638	1,036,529
Sweden . . . . .	...	...	...	1,933	...	(a) 1,803	...	7,311	...	32,075
Switzerland	0	22	1,021	1,248	0	33	1,927	2,848	423	21,220
Yugoslavia	0	46	86	1,792	0	209	622	2,941	353	11,475
Canada . . . . .	...	428	...	877	...	1,036	...	3,254	(a) 3,455	(a) 18,715
United States	0	86	22,911	16,301	7	214	72,367	43,956	419	209,678
Japan . . . . .	...	0	...	8,768	(a) 0	0	(a) 7,527	23,508	0	107,551
Totals	—	269,663	—	163,275	—	581,731	—	414,132	2,550,866	2,610,910

(a) Unwashed wool. — (b) Washed wool.

(1) Up to October 31. — (2) Up to September 30. — (3) Up to July 31. — (4) Up to June 30. — (5) Up to March 31. — (6) From January 1, 1938 to March 31, 1939 excluding trade between Germany and Austria. — (7) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (8) Up to March 15, 1939, the data refer to Czechoslovakia

COUNTRIES	NOVEMBER				ELEVEN MONTHS (January 1-November 30)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938	1938
Butter. — Thousand lb.										
<i>Exporting Countries:</i>										
Bulgaria.	0	11	0	0	11	46	0	0	53	0
Denmark.	24,886	24,555	0	0	305,564	322,112	2	0	348,435	0
Estonia.	1,991	...	...	0	(3) 23,129	30,772	(3) 0	0	32,479	0
Finland.	2,156	...	...	0	(3) 27,593	35,706	(3) 0	0	37,763	0
France.	494	...	132	(4) 3,466	5,849	(4) 1,153	1,268	6,449	1,340	0
Hungary.	130	412	0	0	3,239	7,489	0	0	7,760	0
Ireland. . . . .	...	2,136	...	0	(3) 21,378	41,588	(3) 238	644	42,278	644
Italy. . . . .	...	73	...	31	(4) 970	1,722	(4) 470	412	1,859	463
Latvia. . . . .	...	3,038	...	0	(3) 35,633	48,892	(3) 0	0	51,714	0
Lithuania. . . . .	...	2,698	...	0	(3) 27,419	36,906	(3) 0	0	38,387	0
Norway.	0	51	0	0	121	1,757	0	0	1,797	0
Netherlands.	12,657	6,001	0	0	118,893	106,032	0	7	112,141	7
Poland-Danzig.	—	1,757	—	0	(4) 18,958	28,460	(4) 0	0	29,086	0
Romania.	66	2	0	0	911	256	0	0	256	0
Sweden. . . . .	...	3,111	...	0	(2) 47,589	60,164	(2) 4	2	62,953	0
Yugoslavia.	35	11	—	—	260	183	—	—	196	—
U. S. S. R. . . . .	...	170	...	0	...	622	...	681	743	708
Canada. . . . .	...	368	...	0	(4) 10,538	3,635	(4) 4	5,232	3,821	5,232
Argentina.	3,962	2,965	—	—	17,236	13,168	—	—	16,175	—
Syria and Lebanon. . . . .	...	15	...	4	(3) 1,254	994	(3) 51	51	1,089	64
Union of South Afr. . . . .	...	20	...	0	(1) 5,126	3,093	(1) 24	0	3,536	2
Australia. . . . .	...	27,571	...	0	(1) 184,838	198,152	(1) 4	0	229,407	0
New Zealand. . . . .	...	41,052	...	0	(1) 223,867	274,739	(1) 2	9	293,233	9
<i>Importing Countries:</i>										
Germany (7) (8) . . . . .	...	0	...	15,128	(4) 0	0	(4) 110,445	187,998	0	204,113
Austria (7) . . . . .	...	0	...	0	(6) 0	2,606	(6) 86	7	2,606	165
Belgo-Luxemb. E. U. . . . .	...	2	...	137	(1) 24	42	(1) 2,081	1,819	51	2,540
Bohemia-Moravia (Protectorate) (9) . . . . .	...	0	...	395	(4) 68	1,768	(4) 2,335	1,552	1,773	2,264
Spain. . . . .	...	—	...	172	—	—	988	1,023	—	1,151
Greece. . . . .	...	60	...	—	—	—	—	—	—	—
Portugal. . . . .	...	4	...	0	(1) 115	88	(1) 0	0	115	0
United Kingdom. . . . .	...	562	...	79,481	(3) 7,216	8,327	(3) 732,658	986,204	10,174	1,065,630
Switzerland.	4	2	2,150	11	20	2,284	289	289	11	344
United States.	368	267	93	106	2,191	1,799	1,032	1,071	1,960	1,144
Peru. . . . .	...	0	...	37	(2) 0	194	(2) 243	293	194	355
Burma. . . . .	...	—	137	68	—	—	681	586	—	668
Ceylon. . . . .	...	—	106	88	—	—	968	785	—	858
China. . . . .	...	—	66	37	—	—	549	487	—	531
India: by sea.	551	463	185	84	5,280	5,386	957	880	5,964	968
" : by land.	—	—	...	207	—	—	(4) 3,774	5,426	—	5,908
Netherlands Indies:	...	...	...	...	...	...	...	...	...	...
Java and Madura.	—	—	...	551	—	—	(1) 5,005	6,382	—	7,335
Outer Provinces.	—	—	...	262	—	—	(1) 1,819	2,266	—	2,568
Indochina. . . . .	...	0	...	53	(1) 2	2	(1) 1,940	736	2	820
Iraq. . . . .	...	0	...	7	(4) 2	0	(4) 29	26	0	31
Iran. . . . .	...	0	...	0	(2) 4	20	(2) 176	0	20	0
British Malaya. . . . .	...	55	...	454	(2) 454	584	(2) 3,556	4,378	650	4,691
Palestine.	0	0	412	401	2	7	4,085	4,184	7	4,493
Algeria. . . . .	...	7	...	443	(5) 11	11	(5) 1,922	3,948	11	4,332
Egypt. . . . .	...	35	...	90	(1) 251	293	(1) 743	1,248	335	1,325
French Morocco. . . . .	...	—	...	271	—	—	(5) 1,146	1,843	—	1,953
Tunisia. . . . .	...	0	...	168	(2) 4	0	(2) 955	1,257	2	1,475
Totals.	—	122,055	—	98,818	—	1,243,471	—	1,222,994	1,345,492	1,324,131

(1) Up to October 31 — (2) Up to September 30 — (3) Up to August 31. — (4) Up to July 31. — (5) Up to June 30. — (6) Up to March 31. — (7) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria. — (8) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (9) Up to March 15, 1939, the data refer to Czechoslovakia.

COUNTRIES	NOVEMBER				ELEVEN MONTHS (January 1-November 30)				TWELVE MONTHS (Jan. 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938	1938
Cheese. — Thousand lb.										
<i>Exporting Countries:</i>										
Bulgaria	18	236	0	0	1,343	3,424	0	0	3,660	0
Denmark	1,933	1,680	2	4	19,423	18,437	22	20	20,082	22
Estonia . . . . .	...	20	...	0	(3) 467	392	(3) 2	2	507	2
Finland . . . . .	...	1,755	...	4	(3) 8,073	13,459	(3) 15	26	14,930	35
Hungary	71	66	0	0	688	708	0	2	787	2
Ireland . . . . .	...	302	...	2	(3) 794	1,991	(3) 26	37	2,262	40
Italy . . . . .	...	6,213	...	633	(4) 27,690	48,641	(4) 5,293	9,901	53,286	10,221
Latvia . . . . .	...	9	...	0	(3) 214	247	(3) 0	0	309	0
Lithuania . . . . .	...	328	...	0	(3) 238	1,781	(3) 0	4	2,004	4
Norway	238	293	18	62	3,642	3,280	602	463	3,642	518
Netherlands	9,242	11,197	55	44	104,949	119,339	578	624	128,953	692
Poland-Danzig	—	15	—	22	(4) 214	492	(4) 238	293	500	317
Romania	207	0	18	13	379	106	53	53	110	68
Switzerland	3,075	3,470	203	276	41,485	46,035	3,316	2,970	49,348	3,360
Yugoslavia	403	324	4	2	3,382	3,217	37	42	3,384	46
Canada . . . . .	...	12,536	...	190	(4) 28,136	73,414	(4) 670	1,239	80,989	1,387
Argentina	273	346	...	7	5,068	3,882	(1) 62	93	4,363	108
Union of South Afr. . . . .	...	229	...	40	(1) 3,560	2,447	(1) 238	331	2,716	362
Australia . . . . .	...	4,118	...	13	(1) 30,126	29,203	(1) 110	128	34,732	143
New Zealand . . . . .	...	17,783	...	0	(1) 152,049	167,834	(1) 2	9	180,381	9
<i>Importing Countries:</i>										
Germany (7) (8) . . . . .	...	18	...	6,457	(4) 302	141	(4) 38,367	65,506	225	72,091
Austria (7) . . . . .	...	128	...	115	(6) 44	3,499	(6) 370	1,601	3,536	1,726
Belgo-Luxemb. E. U. . . . .	...	20	...	4,270	(1) 198	249	(1) 44,842	49,410	280	53,312
Bohemia-Moravia (Protectorate) (9) . . . . .	...	73	...	390	(4) 146	1,720	(1) 2,299	2,723	1,753	3,071
Spain . . . . .	...	—	...	—	—	—	—	—	—	—
France . . . . .	...	2,590	...	2,824	(4) 17,712	23,647	(4) 17,650	28,839	26,467	31,301
Greece	29	22	31	31	90	168	1,984	1,413	172	1,534
Portugal . . . . .	...	22	...	33	(1) 170	146	(1) 146	190	154	245
United Kingdom . . . . .	...	392	...	34,553	(3) 2,787	4,491	(3) 217,998	306,364	4,859	329,200
Sweden . . . . .	...	—	...	481	—	—	(2) 2,798	2,271	—	2,687
U. S. S. R. . . . .	...	9	...	71	...	64	...	324	71	337
United States	126	130	6,343	5,926	1,356	1,349	55,594	50,349	1,482	54,432
Chile . . . . .	...	0	...	11	(2) 7	13	(2) 64	75	42	79
Peru . . . . .	...	0	...	68	(2) 2	0	(2) 492	765	0	816
Burma . . . . .	...	—	4	7	—	—	90	84	—	90
Ceylon . . . . .	...	—	11	26	—	—	187	223	—	243
India: by sea	0	0	84	154	4	2	858	1,052	2	1,164
Netherlands Indies: Java and Madura	—	—	...	183	—	—	(1) 1,609	1,845	—	2,035
Indochina . . . . .	...	0	...	46	(1) 0	—	(1) 474	529	2	578
Iraq . . . . .	...	0	...	9	(4) 15	11	(4) 42	53	11	62
Japan . . . . .	...	—	...	0	—	—	(2) 4	42	—	42
British Malaya . . . . .	...	4	...	57	(2) 26	31	(2) 302	368	33	392
Palestine	0	0	207	185	15	29	1,953	1,859	35	2,112
Syria and Lebanon . . . . .	...	29	...	64	(3) 875	666	(3) 421	551	783	591
Algeria . . . . .	...	4	...	1,008	(5) 7	33	(5) 6,605	11,327	35	12,432
Egypt . . . . .	...	22	...	448	(1) 49	84	(1) 4,478	6,967	90	7,478
French Morocco . . . . .	...	—	...	220	—	—	(5) 1,510	3,047	—	3,444
Tunisia . . . . .	...	0	...	348	(2) 121	60	(2) 1,911	2,421	62	2,683
Totals	—	64,383	—	59,297	—	574,734	—	556,435	627,039	601,513

(1) Up to October 31. — (2) Up to September 30. — (3) Up to August 31. — (4) Up to July 31. — (5) Up to June 30. — (6) Up to March 31. — (7) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria. — (8) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel, they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (9) Up to March 15, 1930, the data refer to Czecho-Slovakia.

COUNTRIES	NOVEMBER				TWO MONTHS (October 1-November 30)				TWELVE MONTHS (Oct. 1-Sept. 30)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Cacao. — Thousand lb.										
<i>Exporting Countries:</i>										
Grenada	212	—	—	...	833	—	—	(2) 7,754	—
Haiti	1,038	—	—	...	1,299	—	—	3,979	—
Dominican Republic	575	—	—	(1) 518	4,138	—	—	63,690	—
Brazil	29,754	—	—	...	50,546	—	—	281,271	—
Ecuador	2,015	—	—	...	5,562	—	—	36,174	—
Trinidad	1,049	—	—	...	2,683	—	—	17,921	—
Ceylon	1,265	752	—	—	1,612	1,281	—	—	7,754	—
Netherlands Indies:										
Java and Madura . .	207	311	—	—	337	514	—	—	3,098	—
Cameroon; Fr. m. t.	...	6,418	—	—	...	9,504	—	—	(5) 63,396	—
Ivory Coast	4,506	—	—	...	6,826	—	—	(4) 102,533	—
Gold Coast	41,191	33,795	—	—	62,847	52,475	—	—	643,415	—
Madagascar	0	—	—	...	95	—	—	(3) 798	—
Nigeria and Came-	...	12,551	—	—	(1) 13,292	16,537	—	—	259,104	—
roon
São Thomé and Prin-	...	1,497	—	—	...	2,297	—	—	23,202	—
cipe Islands	805	—	—	...	2,414	—	—	22,688	—
Togo; Fr. m. t
<i>Importing Countries:</i>										
Germany (7) (8)	{ 0 }	...	{ 17,932 }	...	{ 0 }	...	{ 34,181 }	(3) 0	(3) 174,336
Austria (7)	780	...	...	...	3,287	(6) 0	(6) 11,594
Belgo Luxemb. E. U.	...	0	...	1,323	(1) 0	0	(1) 3,225	4,286	168	26,678
Bohemia-Moravia
(Protectorate) (9)	1,973	...	...	...	3,937	...	(3) 20,655
Bulgaria	44	254	...	...	163	414	...	2,121
Denmark	0	0	1,554	924	0	0	2,564	1,239	18	11,133
Spain
Estonia	220	...	...	...	236	...	(2) 1,109
Finland	37	...	...	...	86	...	(2) 487
France	0	...	9,703	...	0	...	17,302	(3) 302	(3) 86,741
Greece	0	...	172	401	2	0	284	725	0	4,101
Hungary	408	849	...	...	591	1,984	...	13,045
Ireland	631	...	...	...	847	...	(2) 6,967
Italy	897	...	...	...	1,237	...	(3) 16,153
Latvia	0	...	157	...	0	...	531	(2) 0	(2) 1,742
Lithuania	196	...	0	...	342	...	(3) 974
Norway	0	0	668	567	0	0	1,543	1,208	0	8,186
Netherlands	0	425	7,915	12,577	0	789	14,614	26,083	1,537	180,200
Poland-Danzig	2,094	...	...	...	4,136	...	(3) 17,807
Portugal	0	...	117	(1) 0	0	(1) 174	207	2	1,215
Romania	0	412	...	...	265	908	...	3,783
United Kingdom	1,316	...	8,902	...	2,588	...	17,287	(2) 9,374	(2) 287,576
Sweden	1,521	...	...	...	3,415	...	17,692
Switzerland	0	18	3,170	913	0	18	4,599	1,984	44	21,874
Yugoslavia	134	251	...	...	262	602	...	3,157
Canada	1,795	...	...	...	3,975	...	(3) 24,101
United States	63,542	20,003	...	...	124,504	47,146	...	583,184
Argentina	816	...	...	(1) 1,089	1,477	...	10,966
Chile	134	...	...	...	243	...	2,081
Colombia	562	...	...	...	1,157	...	(4) 6,360
Peru	0	...	0	...	0	...	84	...	620
Uruguay	106	...	...	...	302	0	1,334
Iran	7	...	...	...	18	...	128
Japan	723	...	...	...	763	...	1,541
British Malaya	11	...	4	...	18	...	7	104	88
Palestine	4	73	...	...	33	126	...	1,451
Algeria	0	...	62	...	0	...	64	(4) 0	(4) 489
Egypt	68	...	(1) 57	...	298	...	639
French Morocco	13	...	...	...	42	...	(4) 139
Tunisia	2	...	...	...	2	...	11
Union of South Africa	174	...	(1) 20	...	238	...	2,377
Australia	0	...	82	(1) 0	0	(1) 55	214	11	14,919
New Zealand	379	...	...	...	518	...	4,191
Totals	97,048	...	88,636	...	160,417	...	183,138	1,548,337	1,573,945

(1) Up to October 31. (2) Up to August 31. — (3) Up to July 31. — (4) Up to June 30. — (5) Up to May 31. — (6) Up to March 31. — (7) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria. — (8) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (9) Up to March 15, 1939 the data refer to Czecho-Slovakia.

COUNTRIES	NOVEMBER				FIVE MONTHS (July 1-November 30)				TWELVE MONTHS (July 1-June 30)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Tea. — Thousand lb.										
<i>Exporting Countries:</i>										
Ceylon	17,663	16,120	0	0	82,376	90,167	0	0	231,627	0
China	2,899	10,375	1,219	340	17,955	56,405	6,374	1,737	83,388	7,015
Chosen . . . . .	...	22	...	0	(2) 218	90	(2) 0	0	269	0
Taiwan . . . . .	...	2,701	...	0	(2) 4,605	14,187	(2) 0	0	20,435	0
India: by sea . . .	29,624	46,972	256	567	204,266	228,173	675	1,446	334,526	4,850
" by land . . .	—	1,010	—	—	(4) 646	5,498	—	—	13,618	—
Netherlands Indies:										
Java and Madura .	11,233	10,199	...	35	52,693	50,023	(1) 123	267	127,256	483
Outer Provinces .	...	2,509	—	—	(1) 10,150	13,442	—	—	32,428	—
Indochina . . . . .	...	472	...	104	(1) 2,482	2,271	(1) 157	569	4,738	944
Japan . . . . .	...	4,775	...	22	(2) 17,203	19,368	(2) 44	73	35,023	130
<i>Importing Countries:</i>										
Germany (7) (8) . .	...	13	...	1,517	(4) 15	68	(1) 1,689	5,545	165	15,040
Austria (7) . . .	...	0	...	121	...	...	...	505	(5) 0	(5) 1,043
Belgo-Luxemb. E.U.	...	0	...	42	(1) 7	0	(1) 216	249	2	664
Bohemia-Moravia (Protectorate) (9) .	—	—	...	104	—	—	(4) 49	620	—	1,336
Bulgaria . . . . .	...	9	...	9	...	...	...	31	—	60
Denmark	0	0	44	207	0	0	699	769	0	1,563
Spain	—	—	—	—	—	—	—	—	—	—
Estonia . . . . .	...	...	...	11	...	...	(3) 15	46	—	101
Finland . . . . .	...	...	...	44	...	...	(3) 46	148	—	317
France . . . . .	...	2	...	267	(4) 0	7	(1) 201	1,067	13	2,800
Greece . . . . .	...	...	22	44	...	...	...	176	—	414
Hungary . . . . .	...	...	2	49	...	...	...	293	—	677
Ireland . . . . .	...	15	...	2,335	(1) 7	26	(3) 2,315	10,692	33	23,715
Italy . . . . .	...	...	...	18	...	...	(4) 60	62	—	311
Latvia . . . . .	...	0	...	4	(3) 0	0	(3) 11	24	0	71
Lithuania . . . . .	...	...	...	7	...	...	(3) 7	29	—	95
Norway	0	0	46	26	0	0	170	163	0	397
Netherlands	4	15	2,793	1,609	46	75	16,127	13,005	203	30,448
Poland-Danzig . . .	—	0	...	373	(4) 0	0	(4) 419	1,609	0	4,127
Portugal . . . . .	...	...	...	31	...	...	...	146	—	317
Romania . . . . .	...	...	37	137	...	...	(1) 465	262	—	800
United Kingdom . .	...	5,115	...	57,600	(3) 8,922	25,995	(3) 83,344	268,678	67,030	501,487
Sweden . . . . .	...	...	...	84	...	...	(2) 355	505	—	1,206
Switzerland	0	0	291	152	4	4	928	858	9	1,978
Yugoslavia . . . . .	...	...	29	44	...	...	161	231	—	485
U. S. S. R. . . . .	...	322	...	302	...	1,296	...	10,878	(6) 1,510	(10) 23,281
Canada . . . . .	...	...	...	3,450	...	...	(4) 1,437	15,695	—	41,306
United States . . . .	...	...	9,954	8,404	...	...	39,212	35,415	—	89,601
Argentina . . . . .	...	...	...	463	...	...	(1) 1,777	1,989	—	4,802
Chile . . . . .	...	...	...	500	...	...	(2) 1,294	2,615	—	6,792
Peru . . . . .	...	...	...	73	...	...	(2) 245	494	—	1,074
Uruguay . . . . .	...	...	...	66	...	...	(2) 86	249	—	450
Burma	185	11	205	44	428	119	855	137	163	2,255
Iraq . . . . .	...	0	...	500	(4) 0	55	(4) 564	2,851	71	7,300
Iran . . . . .	...	0	...	1,717	(2) 0	0	(2) 4,165	6,920	0	17,785
British Malaya . . .	...	79	...	397	(2) 368	545	(2) 1,058	2,136	1,495	5,060
Manchukuo . . . . .	...	...	...	1,936	...	...	(3) 2,196	9,778	—	17,655
Palestine	0	0	86	68	0	0	240	223	0	675
Syria and Lebanon . .	...	...	33	33	(3) 0	0	(3) 40	181	0	465
Turkey . . . . .	...	...	106	185	...	...	871	816	—	7,174
Algeria . . . . .	...	0	...	289	...	2	...	1,651	2	3,217
Egypt . . . . .	...	...	...	1,093	...	...	(1) 4,572	6,574	—	16,535
French Morocco . . .	...	201	...	1,871	...	487	...	10,126	712	17,899
Tunisia . . . . .	...	...	...	295	...	...	(2) 1,113	1,958	—	5,562
Union of South Afr.	...	44	...	1,579	(1) 174	168	6,120	7,233	659	16,865
Australia . . . . .	...	53	...	3,977	(1) 245	236	(1) 18,036	22,611	461	48,628
New Zealand . . . .	...	22	...	1,043	(2) 26	82	(2) 3,470	4,694	165	11,407
Totals	—	101,047	—	94,388	—	508,789	—	45,038	956,001	943,662

(1) Up to October 31. — (2) Up to September 30. — (3) Up to August 31 — (4) Up to July 31. — (5) Up to March 31. — (6) Up to December 31. — (7) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria. — (8) As from April 1, 1939, the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel, they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (9) Up to March 15, 1939 the data refer to Czechoslovakia.

COUNTRIES	NOVEMBER				FIVE MONTHS (July 1-November 30)				TWELVE MONTHS (July 1-June 30)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Coffee. — Thousand lb.										
<i>Exporting Countries:</i>										
Costa-Rica	2,253	1,316	—	—	5,124	4,458	—	—	45,429	—
Guadeloupe	—	2	—	—	—	49	—	—	754	—
Guatemala	9,434	11,039	—	—	16,594	18,898	—	—	96,390	—
Jamaica	—	957	—	—	(1) 1,918	3,792	—	—	9,808	—
Haiti	—	4,171	—	—	(2) 10,203	18,188	—	—	64,854	—
Mexico	—	3,439	—	—	(1) 2,676	11,559	—	—	79,766	—
Nicaragua	—	119	—	—	—	3,997	—	—	35,444	—
Dominican Republic	—	1,658	—	—	(1) 5,637	5,370	—	—	30,459	—
Salvador	—	2,692	—	—	(1) 9,751	17,899	—	—	130,792	—
Brazil	—	159,068	—	—	(2) 810,365	932,173	—	—	2,155,720	—
Colombia	44,000	44,304	—	—	(1) 185,665	236,246	—	—	537,319	—
Ecuador	—	—	—	—	—	—	—	—	31,326	—
Netherlands Guiana	—	507	—	—	(1) 1,349	2,540	—	—	5,404	—
Peru	—	626	—	—	(2) 2,540	3,111	(2) 0	2	6,546	4
Venezuela	—	—	—	—	(1) 14,522	(1) 25,574	—	—	88,410	—
Aden: by sea	—	899	—	—	(2) 3,706	4,689	—	—	11,380	—
India: by sea	2,218	364	0	0	4,160	2,454	0	2	23,153	7
Netherlands Indies	—	—	—	—	—	—	—	—	—	—
Java and Madura	5,051	5,110	—	—	30,139	26,524	—	—	55,202	—
Outer Provinces	—	10,772	—	—	(1) 38,837	59,362	—	—	106,993	—
Indochina	220	20	—	7	917	251	(1) 26	33	1,459	106
Belgian Congo	—	2,359	—	—	(2) 8,880	15,536	—	—	45,299	—
Ivory Coast	—	1,704	—	—	—	9,802	—	—	(5) 32,221	—
Kenya	—	2,961	—	—	(1) 7,255	8,591	—	—	38,142	—
Uganda	—	2,650	—	—	—	14,416	—	—	35,084	—
Madagascar	—	9,623	—	—	(1) 1,089	36,517	—	—	76,214	—
Tanganyika	—	2,044	—	—	—	17,271	—	—	30,622	—
<i>Importing Countries:</i>										
Germany (8) (9)	—	0	—	44,011	(1) 0	0	(1) 29,912	187,056	0	403,613
Austria (8)	—	—	—	1,484	—	—	—	—	(6) 0	14,326
Belgo-Luxemb E. U.	—	948	—	8,076	(1) 267	2,758	(1) 44,604	47,863	4,070	118,036
Bohemia-Moravia (Protectorate) (10)	—	—	—	1,473	—	—	(1) 1,411	10,944	—	25,477
Bulgaria	—	—	68	117	—	—	439	496	—	1,279
Denmark	18	0	5,695	5,260	154	0	39,024	37,867	115	82,081
Estonia	—	—	—	15	—	—	(3) 60	117	—	295
Finland	—	—	—	4,123	—	—	(3) 13,955	23,565	—	56,031
France	—	2	—	45,413	(1) 0	53	(1) 26,861	154,500	60	389,272
Greece	—	—	425	1,596	—	—	4,200	6,334	—	13,018
Hungary	—	—	44	284	—	—	2,055	2,180	—	5,390
Ireland	—	0	—	24	(3) 0	11	(3) 110	185	11	542
Italy	—	7	—	9,041	(1) 0	7	(4) 5,842	33,632	7	79,503
Latvia	—	—	—	55	(3) 0	0	(3) 95	172	0	463
Lithuania	—	—	—	26	—	—	(3) 37	121	—	320
Norway	0	9	4,980	4,414	—	62	16,261	17,866	104	44,174
Netherlands	42	1,318	5,280	10,437	(3) 3,280	6,973	41,553	53,041	16,339	113,585
Poland-Danzig	—	—	—	1,144	(1) 0	2	(1) 1,378	6,014	4	14,654
Portugal	—	93	—	977	(1) 966	620	(1) 5,992	5,437	1,903	13,761
Romania	—	—	509	668	—	—	2,584	3,045	—	8,025
United Kingdom	—	1,111	—	1,459	(3) 1,387	7,050	(3) 1,722	4,389	12,295	49,739
Sweden	—	—	—	9,879	—	—	(1) 36,301	51,948	—	115,525
Switzerland	13	0	2,575	2,998	—	4	0	19,493	4	42,426
Yugoslavia	—	—	1,215	1,327	—	—	6,387	6,380	—	15,839
U. S. S. R.	—	—	—	245	—	—	—	1,347	—	(7) 1,556
Canada	—	26	—	3,627	(1) 11	106	(4) 2,795	15,795	351	45,367
United States	1,016	818	205,981	182,892	5,203	2,859	823,129	799,425	10,598	1,965,955
Argentina	—	—	—	4,491	—	—	(1) 24,619	24,502	—	50,892
Chile	—	—	—	571	—	—	(2) 3,366	3,305	—	6,967
Uruguay	—	—	—	591	—	—	(2) 1,276	2,780	—	5,540
Ceylon	55	0	9	31	267	7	104	126	269	302
Burma	0	0	108	141	0	0	1,819	1,276	2	3,170
Iraq	—	0	—	68	(4) 0	0	(1) 247	657	0	2,588
Iran	—	0	—	44	(2) 0	0	(2) 37	529	0	802
Japan	—	15	—	273	(2) 20	170	(2) 231	3,338	326	6,279
British Malaya	—	710	—	1,268	(2) 2,557	2,716	(2) 6,027	8,133	7,297	21,030
Palestine	0	0	141	225	(1) 4	0	985	1,019	0	3,624
Syria and Lebanon	—	—	—	161	(3) 0	0	(3) 613	999	0	3,122
Turkey	—	—	1,437	717	—	—	5,315	4,348	—	12,260
Algeria	—	0	—	3,902	—	0	—	17,253	7	36,506
Egypt	—	—	—	926	—	—	(1) 4,652	4,733	—	12,081
French Morocco	—	—	—	505	—	—	—	2,044	—	5,234
Tunisia	—	0	—	357	(2) 2	7	(2) 922	1,303	11	4,310
Union of South Afr.	—	0	—	2,652	(1) 79	9	(1) 14,890	15,860	24	33,193
Australia	—	9	—	218	(1) 46	49	(1) 1,852	1,373	106	4,506
New Zealand	—	0	—	40	(2) 0	0	(2) 185	271	0	569
Totals	—	273,470	—	358,253	—	1,502,726	—	1,587,363	3,828,003	3,833,334

(1) Up to October 31. — (2) Up to September 30. — (3) Up to August 31. — (4) Up to July 31. — (5) Up to May 31. —

STOCKS ***Stocks of cereals in farmers' hands in the United States.**

PRODUCTS	Percentage of total production					Stocks in 1,000 cents				
	Jan. 1 1940	Oct. 1 1939	Jan. 1 1939	Jan. 1 1938	Jan. 1 1937	Jan. 1 1940	Oct. 1 1939	Jan. 1 1939	Jan. 1 1938	Jan. 1 1937
Wheat	31.6	44.9	30.1	23.8	20.5	143,337	199,328	168,053	125,106	76,988
Oats	63.5	81.3	65.1	60.1	61.4	190,299	244,873	222,622	223,498	154,291
Maize (1)	73.7 ⁽²⁾	24.0	78.9	71.2	64.4	1,081,256	305,789	1,019,038	937,004	451,884

(1) Data based on maize for grain. — (2) Percentage of previous year's crop.

Commercial cereals in store in Canada and the United States.

PRODUCTS AND LOCATION	Friday or Saturday nearest 1st of month (1)				
	January 1940	December 1939	November 1939	January 1939	January 1938
	thousand cents				
WHEAT:					
Canadian in Canada . . . . .	...	189,777	201,267	96,697	31,604
U. S. in Canada . . . . .	...	488	581	256	1,115
U. S. in the United States	79,705	85,192	90,609	77,249	56,712
Canadian in the United States	23,270	20,636	9,485	4,724	2,869
TOTAL . . . . .	...	296,093	301,942	178,926	92,300
RYE:					
Canadian in Canada . . . . .	...	1,243	1,703	1,135	715
U. S. in Canada . . . . .	...	13	13	13	381
U. S. in the United States	5,902	5,574	5,923	4,687	2,645
Canadian in the United States	409	528	538	24	0
TOTAL . . . . .	...	7,358	8,177	5,859	3,741
BARLEY:					
Canadian in Canada . . . . .	...	3,501	5,018	3,683	4,839
U. S. in Canada . . . . .	...	2	2	0	0
U. S. in the United States	8,935	9,651	9,791	7,207	5,632
Canadian in the United States	1,141	735	277	0	70
TOTAL . . . . .	...	13,839	15,088	10,890	10,541
OATS:					
Canadian in Canada . . . . .	...	3,042	3,821	3,015	3,178
U. S. in Canada . . . . .	...	68	79	466	1,221
U. S. in the United States	3,857	4,224	4,657	5,414	8,265
Canadian in the United States	428	374	301	0	0
TOTAL . . . . .	...	7,708	8,858	8,895	12,664
MAIZE:					
U. S. in Canada . . . . .	...	1,757	2,618	2,742	531
Argentine in Canada . . . . .	...	0	1	17	245
South African in Canada . . . . .	...	886	1,141	322	1,786
Australian in Canada . . . . .	...	0	0	115	0
U. S. in the United States	25,677	21,393	15,423	29,483	20,252
Of other origin in the United States	0	0	0	0	0
TOTAL . . . . .	...	...	19,183	32,679	22,814

(1) Friday for Canada, Saturday for the United States. — (2) Data for December 8.

* For stocks of cotton at Bombay, Alexandria and Port Sudan, see page 78.

Wheat and wheat-flour in the Union of South Africa.

LOCATION	Last day of month				
	November 1939	October 1939	September 1939	November 1938	November 1937
	thousand cents				
Wheat held by millers:					
South African	952	1,089	1,755	745	2,558
Imported	58	46	4	372	6
Wheat held by co operatives	251	13	67	231	307
TOTAL . . .	1,261	1,148	1,826	1 348	2 871
Wheat flour and boermeal ⁽¹⁾ held by millers	266	261	230	260	141
Grand total ⁽²⁾ . . .	1,629	1,511	2,144	1,701	3,061

(1) 140 lb of wheat flour or 165 lb. of boermeal correspond to 200 lb of wheat — (2) Including flour in terms of grain

Imported cereals in Antwerpen.

PRODUCTS AND LOCATION	Last day of month				
	December 1939	November 1939	October 1939	December 1938	December 1937
	thousand cents				
Wheat	1,531	1,522	1,014	1,262	2,328
Rye	4	44	2	58	46
Barley	336	229	58	193	352
Oats	0	0	0	0	12
Maize	256	374	16	35	34

Cotton stocks on hand in the United States.

LOCATION	Last day of month				
	December 1939	November 1939	October 1939	December 1938	December 1937
	thousand cents				
In consuming establishments	9,144	8,766	7,201	8,345	8,513
In public storage and at compresses . . .	71,740	76,182	76,108	75,425	59,093
TOTAL . . .	80,884	84,948	83,309	83,770	67,606

PRICES**PRICES BY PRODUCTS (1)**

All quotations are spot, on Fridays, unless otherwise stated. The monthly averages are based on the Friday quotations, and the yearly averages on the monthly

DESCRIPTION	Jan	Jan	Dec	Dec	AVERAGE				Commercial Season (2)	
	1	5	1	1	Dec	Jan	Jan		1938-39	1937-38
	1910	1910	1939	1939	1939	1939	1939			
Wheat										
Budapest Tisza wheat, 78 kg per hl (pengo per quintal)	20 55	21 55	20 45	20 45	20 45	20 42	21 30		20 42	21 44
Braila Home grown, good qual (lei p ql)	n q	480	470	450	452	433	522		411	520
Winnipeg No 1 Manitoba (cents p 60 lb)	81	82	84	83	81	60	149		62	131 1/2
Chicago No 2 Hard Winter (cents p 60 lb)	101 1/2	106 1/2	n 107	n 106 1/2	101	n 72	n 101		70 1/2	96 1/2
Minneapolis (cents per 60 lb)										
No 1 Northern	100 1/2	105 1/2	105	104 1/2	100	75 1/2	111		74 1/2	104 1/2
No 2 Amber Durum	87 1/2	93		89 1/2		69	100		68 1/2	93 1/2
New York No 2 Hard Winter (f o b cents per 60 lb)	121	126	126	125	122	82 1/2	117		84 1/2	112 1/2
Buenos Aires (a) No 2 Hard, 80 kg per hl (paper pesos per quintal)	8 05	8 35	8 30	8 35	7 91	7 00	12 22		6 69	12 20
Karachi White Karachi, 2% barley 1% impurities (rupees per 65 lb)	31-6-0	33-0-0	32-0-0	32-10-0	32-6-10-24	15-3-29-2-6	22	12-8	26-15-9	
Antwerpen (francs per quintal)										
Home-grown	148 00	148 00	148 00	144 00	145 80	119 00	140 00		123 75	135 05
No 1 Manitoba (Atlantic, c i f, arrived)	153 00	156 00	154 00	156 00	140 00	92 60	197 10		96 25	171 20
Bahia (c i f, arrived)	141 00	147 00	148 50	148 00	130 00	77 25	159 00		79 00	142 10
London, Mark Lane English (sh per 404 lb, at farm)	31 6	31 6	31 6	31 6	31 6	19 6	37 8 1/2		20 7 1/2	37 7 1/2
London, Baltic (f o b parcels, sh per 460 lb)										
No 1 Northern Manitoba (St John)	33 10 1/2	36 6	36 9	37	35 9 1/2	-	-		-	-
No 1 Northern Manitoba (Pacific)	29 10 1/2	30 7 1/2	30 7 1/2	31 1 1/2	29 10 1/2	-	-		-	-
Argentina	n q	n q	n q	n q	-	-	-		-	-
Australia	26	26 6	25 9	25	23 7 1/2	-	-		-	-
Rye										
Budapest Pest rye (pengo p quintal)	15 82	15 82	15 43	15 27	15 26	14 05	19 08		14 34	18 57
Winnipeg No 2 rye (cents p 56 lb)	73 1/2	72		71 1/2		41 1/2	81		40 1/2	72 1/2
Minneapolis No 2 rye (cents p 56 lb)	67	70		70		45	75		44	67 1/2
Antwerpen (francs per quintal)										
Home grown	n q	n q	n q	n q	* 115 35	n q	127 00		n q	124 85
Daubian (c i f, arrived)	n q	n q	n q	n q	* 109 65	86 50	129 25		81 80	123 30
Soviet (c i f, arrived)	129 00	137 00	140 00	140 00	127 20	64 75	122 00		61 15	112 50
Plata (c i f, arrived)	127 00	135 00	137 00	138 50	124 30	86 75	129 50		80 80	124 55
Barley										
Braila Average quality (lei p quintal)	415	n q	420	410	420	374	* 383		338	365
Winnipeg No 4 West (cents p 48 lb) (1)	48	47				35 1/2	60		34 1/2	56 1/2
Chicago Feeding (on sample, cents p 48 lb)	47	41	44	44	41	40 1/2	55		40 1/2	51 1/2
Minneapolis No 2 Feeding (cents p 48 lb)	48 1/2	48 1/2		47 1/2		42	60		40 1/2	53 1/2
Antwerpen (c i f, arrived frs per ql)										
Daubian	133 00	139 00	144 00	143 00	127 60	78 65	117 60		75 45	106 10
No 2 Federal (1)	n q	n q	n q	n q	n q	76 85	108 75		71 40	100 80
Plata, 64/65 kg per hl	137 00	145 00	146 00	115 00	129 40	75 85	111 50		74 20	106 80
London, Mark Lane English malting (sh per 448 lb, at farm)	75 -	75 -	75 -	75 -	71 -	35	34 4		36 1	53 1/2
London, Baltic (f o b St John, parcels, sh per 400 lb)										
No 1 Canadian Feed	24 10 1/2	n q	25 10 1/2	25 3	* 25 6 1/2	-	-		-	-
No 3 Canadian 6 row	22 26 -	22 26 3	25 9	25 6	25 10 1/2	-	-		-	-

* Indicates that the product was not quoted during part of the period under review — n q = not quoted — n = nominal
(1) Thursday prices

(2) In relation to Government price fixing, numerous series are omitted from this table, notes concerning them are given on p 1060 of the Nov Crop Report for the United Kingdom and on p 1163 of the Dec issue for Italy; further notes will be published in future Crop Reports — (1) August July — (2) As from Sept 22, 1939 No 2 Feeding barley — (3) As from Sept. 3, 1938 No 3 Federal — (4) Dec 1 51 1/2, Nov 24 78 average Nov 79 — (5) Shipping Hultin — (6) Shipping Jan 1 15 — (7) Shipping Jan — (8) Dec 15 75 1/2, Dec 8 69 1/2, Dec 1 61 1/2, Nov 24 55 1/2 average Nov 56 1/2 — (9) Dec 1 55 1/2, Nov 19 1/2 average Nov 50 1/2 — (10) Dec 1, Nov 24 and average Nov 43 1/2 — (11) No 2 Canadian six row

DESCRIPTION	Jan 12 1940	Jan 5 1940	Dec 29 1939	Dec 22 1939	AVERAGE				Commercial Season ¹⁾	
					Dec 1939	Jan 1939	Jan 1938		1938-39	1937-38
Oats										
Winnipeg No 2 White (cents per 34 lb)	42	42 1/4		41 1/4 ^{a)}		30	56 1/4		29	50 1/4
Chicago No 2 White (cents per 32 lb)	43 1/2	43 1/4	41 1/4	41 1/4	41 1/4	32 1/4	34 3/4		30 1/4	32 1/4
Buenos Aires (a) No 2 White, 49 kg per hl (paper pesos p quintal)	5 20	5 30	5 40	5 35	5 22	4 55	6 70		4 81	6 32
London, Mark Lane English white (sh per 336 lb, at firm)	n 50/-	n 50/-	52 6	52/6	44/10 1/4	19 3	27 2 1/4		19/3 1/4	26/6 1/4
London, Baltic (f o b St John parcels, sh per 320 lb)										
No 1 Canadian feeding	⁴⁾ 20/10 1/2	22/3	⁵⁾ 22/	⁵⁾ 21/9	⁴⁾ 20/8	—	—		—	—
No 2 Canadian Western	23/10 1/2	24/7 1/4	⁵⁾ 23/6	⁵⁾ 24/1 1/4	⁴⁾ 22/6	—	—		—	—
Milano (b) (lire per quintal)										
Home grown	147 50	n q	147 50	147 50	127 50	99 50	101 50		98 00	100 05
Foreign	n q	n q	n q	n q	n q	95 50	98 00		95 90	97 15
Maize.										
Braila Average quality (lei p quintal)	335	340	310	300	291	425	325		362	* 313
Chicago No 3 Yellow (cents p 56 lb)	57 1/4	59	58	57 1/4	56 1/4	51 1/4	59 1/4		51 1/4	83
Buenos Aires (a) Yellow Plata (paper pesos per quintal)	6 55	6 80	6 90	7 10	6 96	7 40	9 92		6 89	7 79
Antwerpen (cif arrived, francs p ql)										
Bessarabian	n q	n q	n q	n q	n q	89 00	n q		87 90	n q
Yellow Plata	123 00	131 00	137 00	136 00	125 70	89 85	112 80		90 20	101 00
Cinquantino (Argentine Currentino)	135 50	141 00	146 00	147 00	136 60	118 25	116 75		118 05	109 05
London Baltic (f o b parcels, sh per 480 lb)										
No 2 Yellow American (Baltim n)	⁴⁾ 29 9	31 -	30 3	30 -	29 5 1/4	—	—		—	—
Yellow Plata	22 10 1/2	23/6	23/7 1/4	⁵⁾ 23/10	⁴⁾ 23/8 1/4	—	—		—	—
No 2 White flat African	21/6	20	⁵⁾ 20/	20/3	20 4 1/4	—	—		—	—
Rice (milled)										
Rangoon (delivery current month rupees per 7500 lb)									1939	1938
No 2 Lurpe (Burma)	292-8	287-8	280-0	297-8	281-14	210-10	231-10		255-2	255-12
Kanungtoo small mills specials	266-0	262-8	255-0	270-0	259-8	193-0	204-2		231-9	219-1
Big mills specials	255-0	255-0	245-0	262-8	251-8	189-0	193-2		226 14	207-0
Saigon (Indochinese piastres p quintal)										
No 1 Round white 25% broken			12 89	12 64	⁷⁾ 11 82	8 56	9 13		9 26	10 66
No 2 Japan 40% broken			11 90	n q	n q	8 26	8 82		8 54	10 11
Tokyo "Tyumai" brown Japanese average quality (yens per koku)					^{a)}	35 12	33 11			34 26
Linseed.										
Buenos Aires (a) Current quality 4/ impurities (paper pesos p quintal)	17 00	17 40	17 00	17 45	17 22	13 46	16 04		15 12	14 31
Bombay Bold (rupees per cwt)	11-9-0	11-13-0	11-5-0	11-14-0	11-9-2	7-2-1	8-0-10		7-12-7	7-4-10
Antwerpen Plata (cif, arrived frs per quintal)	n 252 00	n 259 00	n 265 00	n 267 00	n 249 00	152 00	186 00		182 50	166 20
London (cif shipping current or fol lowing month £ per long ton)										
La Plata	¹⁾ 116-0-0	⁴⁾ 116-5-0	¹⁰⁾ 116-0-0	¹⁰⁾ 116-2-6	15-15-6	10-17 2	12-15-11		* 12-2-3	11-10-11
Bombay	22-12-6	22-10-0	22-5-0	¹¹⁾ 22-5-0	21-19-0	12-19-4	15-4-1		* 14-10-3	13-3-1
Duluth No 1 Northern (futures cents per 56 lb) ^(b)	205	208	210	198	195	186 1/4	204 1/4		172 1/4	183 1/4
Minneapolis No 1 Northern (cts p 56 lb)	216	217		207 1/4 ¹¹⁾	¹¹⁾ 194 1/4	194 1/4	216 1/4		190	190
Cottonseed.										
Alexandria (a) (piastres per ardeb)									1938-39	1937-38
Upper Egyptian	67 3	71 5	68 0	62 0	¹²⁾ 64 5	65 7	55 9		57 7	55
Sakellariis	65 9	69 7	66 4	60 3	¹⁴⁾ 62 7	61 3	51 3		54 3	50 7
London Egyptian (cif shipping cur rent or following month £ per long ton)	8-0-0	8-3-9	¹¹⁾ 8-5-0	¹¹⁾ 8-10-0	7-18-5	6-15-7	6-4-1		6-3-5	6-1 6

* Indicates that the product was not quoted during part of the period under review — n q = not quoted —
n = nominal — (a) Thursday prices — (b) Saturday prices

(¹⁾ Oats August July maize May April, cottonseed Sept August — (²⁾ Quotations refer to May futures from January to May, to July futures in June and July, to September futures in August and September, and to December futures during the other months — (³⁾ Dec 15 37 1/4, Dec 8 35 1/4, Dec 1 35 1/4, Nov 24 32 1/4, average Nov 32 1/4 — (⁴⁾ Canadian feeding No 2 — (⁵⁾ Shipping Jan — (⁶⁾ Shipping St John — (⁷⁾ Shipping Feb — (⁸⁾ Dec 15 11 65, Dec 8 11 56, Dec 1 10 34 — (⁹⁾ From Nov 10 to Dec 15 43 30, from Oct 6 to Nov 3 38 20; average Nov 42 02 — (¹⁰⁾ New crop, shipping Jan — (¹¹⁾ Shipping Jan Feb — (¹²⁾ Dec 1 190 1/4, Nov 24 176, average Nov 179 1/4 — (¹³⁾ Dec 15 62 5 — (¹⁴⁾ Dec 15 60 8

DESCRIPTION	Jan.	Jan.	Dec.	Dec.	Average				
	12	5	29	22	Dec.	Jan	Jan	Commercial	
	1940	1940	1939	1939	1939	1939	1938	Season (1)	
								1938-39	1937-38
Cotton.									
New Orleans: Middling (cents p. lb.). . .	n. 10.70	n. 11.09	n. 11 12	n. 10.92	n. 10.64	8.71	8.68	8.75	8.87
New York: Middling (cents per lb.). . .	n. 11.21	n. 11.29	n. 11.36	n. 11.15	n. 10.94	8.85	8.55	9.00	8.75
Bombay (rupees p. 784 lb.):									
Broach, f.g. (futures) (1)	307-8	328-8	314-0	299-8	303-14	156-15	173-5	156-2	166-11
Broach, f.g. (spot)	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	* 156-6	* 162-9
Oomra, fine (spot)	274-0	292-0	274-0	276-0	270-13	147-4	160-4	* 148-12	* 148-13
Alexandria (a) (talaris per kantar):									
Sakellariadis, f.g.f.	21.70	21.85	20.90	20.30	20.62	12.25	14.35	12.37	14.19
Giza 7, f.g.f.	18.72	18.72	17.67	17.07	17.32	12.07	13.01	12.34	12.81
Ashmuni, f.g.f.	18.62	18.37	17.42	16.77	16.86	10.17	10.47	10.16	10.62
Liverpool (pence per lb.):									
Middling, super good	n. 9.58	n. 9.89	n. 9.30	n. 9.38	n. 9.04	5.89	5.73	5.88	5.79
Middling	8.98	9.29	8.70	8.78	8.44	5.19	4.93	5.17	4.97
São Paulo, g.f.	n. 9.13	n. 9.44	...	n. 8.93	...	5.19	5.18	5.14	5.16
Broach, good staple, f.g. (1)	n. 8.02	n. 8.30	...	n. 7.77	n. 3.97	n. 3.99	n. 3.99	n. 3.92	n. 4.04
C.P. Oomra, good staple, superfine (1)	n. 8.13	n. 8.54	n. 7.91	n. 8.01	n. 7.68	4.12	4.28	4.11	4.29
Giza 7, f.g.f.	10.77	11.30	10.35	10.37	9.84	7.36	7.58	7.22	7.42
Upper Egyptian, f.g.f.	10.39	10.85	9.92	9.96	9.43	5.91	6.25	6.00	6.31
Butter.									
								1939	1937
Kobenhavn (a) Danish, for export (cirs per quintal)	284.00	286.00	286.00	286.00	268.00	253.75	235.00	239.00	230.49
Leeuwarden, Commission for butter quotations (a): Dutch, for export (cents per kg) (1)	82	81	80	80	80	84 1/4	80	77 1/4	80 1/4
Antwerpen, auction: Belgian (frs p. kg)	23.65	27.05	25.45	23.35	23.00	24.40	24.65	20.70	23.30
New York (b) 92 score, creamery (cents per lb.)	82.00	31 1/2	30	32 1/4	30 1/4	26 1/4	33 1/4	26 1/4	28
Cheese.									
Roma: Roman Pecorino, choice (lire per quintal)	1,167.50	1,167.50	1,137.50	1,137.50	1,137.50	1,100.00	1,050.00	1,110.25	1,058.30
Alkmaar: Edam 40+, National Mark, factory cheese, small (florins p. 50 kg)	23.75	24.00	23.00	22.00	20.70	20.06	21.25	19.35	21.33
Gouda: Gouda 45+, National Mark, farm made, 1st quality (florins p. 50 kg)	32.00	31.00	29.75	29.50	29.95	26.50	27.69	26.52	25.72
Eggs.									
Antwerpen, auction: Belgian, average quality (frs. per 100)	59.00	65.00	60.00	58.00	60.00	60.00	57.50	56.00	58.80
Denmark (c): Danish for export (cirs. per quintal)	116.00	130.00	130.00	130.00	149.60	113.60	131.20	112.53	116.70
Apeldoorn (d): Dutch, average quality 57/58 gr. each (fl. per 100).	3.75	3.90	4.20	3.90	4.16	3.92	3.85	3.85	3.85
Barneveld (a): Dutch, average quality 57/58 gr. each (fl. per 100)	3.80	4.20	4.00	3.95	4.16	4.03	3.74	3.94	3.90

* Indicates that the product was not quoted during part of the period under review. — n. q. = not quoted — n. = nominal. — (a) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks commencing on Thursdays. — (d) Prices on following Mondays.

(1) Cotton: August-July. — (2) Quotations refer to April-May futures during the period September-May following, and to July-August futures during the other months. — (3) As from May 15, 1939: "fair staple". — (4) For home prices these quotations must be increased by a consumption tax which, as from Oct. 19, 1939, amounts to 80 cents per kg. — (5) Dec. 15: n. 10.99. — (6) Dec. 15: n. 11.33. — (7) Dec. 15: 323-0. — (8) Prices of Dec. 15 for the different qualities: respectively, 22.00; 19.27; 18.17 n. 9.19, 8.59; n. 8.74; n. 7.53; n. 7.77; 10.19; 9.62.

AVERAGE MONTHLY PRICES BY COUNTRIES (1)

GROUPS	DESCRIPTION	AVERAGE							Agricultural year (2)	
		Dec.	Nov.	Oct.	July-Sept.	Oct.-Dec.	Oct.-Dec.		1938-39	1937-38
		1939	1939	1939	1939	1938	1937			

GERMANY (Prices in Reichsmarks per quintal)

A I	†Wheat (Berlin)	20.40	20.20	20.00	19.60	20.30	20.33	20.56	20.52
	†Rye (Berlin)	18.20	18.50	18.30	17.90	18.50	18.80	18.81	18.69
	†Barley, feeding (Berlin)	17.20	17.00	16.80	16.40	17.03	17.03	17.08	16.99
	†Oats (Berlin)	17.30	17.20	17.10	17.33	17.30	16.50	17.51	16.87
	†Potatoes, red (Berlin) . . . . .	...	4.30	4.30	6.60	4.37	4.30	5.02	4.91
	†Hops (Nürnberg) . . . . .	...	450.00	450.00	450.00	470.00	457.33	493.45	437.33
A II	†Oxen, live weight (Berlin) . . . . .	...	89.00	89.00	88.33	88.13	85.27	86.35	84.15
	Calves, live weight (Berlin) . . . . .	...	94.20	94.80	95.40	95.40	94.33	95.40	93.98
	†Pigs, 220-265 lb., live weight (Berlin) . . . . .	...	105.00	105.00	105.40	101.00	101.87	101.67	101.88
	Milk, fresh (Berlin) per hectolitre	n. q.	n. q.	n. q.	16.62	15.60	15.60	16.11	15.35
	†Butter, National Mark	274.00	274.00	274.00	274.00	272.77	260.00	257.68	260.00
	Creamery butter	260.00	260.00	260.00	260.00	257.67	246.00	271.69	246.00
	†Cheese, Emmenthal type (Kempten)	166.00	166.00	166.00	165.00	160.00	160.00	160.00	160.00
	Soft cheese, 20 % butterfat (Kempten)	58.00	58.00	58.00	58.00	58.00	58.00	58.00	58.00
	†Eggs, aver. size, marked "G.I.B." (Berlin) per 100 . . . . .	...	11.50	10.50	10.50	11.38	10.25	10.35	10.08
B I	§Basic slag, 16 % (Aachen) (3) . . . . .	...	0.192	0.196	0.220	0.207	0.203	0.214	0.212
	§Superphosphate of lime, 18 % (4) . . . . .	...	0.298	0.314	0.310	0.301	0.304	0.309	0.309
	§Potash salts, 40 % (4)	5.14	5.06	5.05	4.97	5.08	5.08	5.05	5.05
	§Sulphate of ammonia, 21% (4)	0.460	0.450	0.440	0.420	0.450	0.450	0.457	0.457
B II	Wheat-bran (Hamburg)	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25
	Linseed cake (Hamburg)	16.25	16.25	16.25	16.25	16.25	16.30	16.26	16.25
	Coconut cake (Hamburg)	14.65	14.65	14.65	14.65	14.65	14.70	14.66	14.65
	Groundnut cake (Hamburg)	15.75	15.75	15.75	15.75	15.75	15.80	15.76	15.75
	Crushed soya extraction residue (Hamburg)	15.45	15.45	15.45	15.45	15.45	15.50	15.46	15.45

BELGIUM (Prices in Belgian francs per quintal)

A I	Wheat (Antwerpen)	143.80	142.00	142.25	124.00	119.40	137.05	123.80	136.5
	Rye (Antwerpen)	* 115.35	116.25	* 123.50	n. q.	n. q.	124.45	n. q.	126.00
	Barley (Antwerpen)	* 154.00	155.25	163.50	n. q.	n. q.	126.45	n. q.	126.10
	Oats (Antwerpen)	98.40	93.35	95.25	79.30	83.40	118.40	90.60	119.65
	§Potatoes (Leuven)	32.00	32.00	35.00	33.15	29.50	38.65	35.15	45.30
	§Flax, fibre (Gent)	2,400.00	1,987.50	1,900.00	1,686.00	1,746.35	1,670.00	1,702.15	1,702.00
A II	Oxen, live weight (Curegem-Anderlecht)	505.00	477.00	480.00	507.35	506.65	518.65	510.00	523.10
	Calves, live weight (Curegem-Anderlecht)	863.00	773.00	597.00	632.35	1,002.35	815.00	825.00	803.00
	Pigs, live weight (Curegem-Anderlecht)	615.00	650.00	742.00	691.35	899.65	623.00	801.00	677.00
	§Butter (Antwerpen)	2,360.00	2,045.00	1,820.00	1,906.65	2,625.35	2,539.35	2,272.00	2,354.00
	§Eggs (Antwerpen) per 100	60.00	78.00	75.75	58.70	72.00	75.35	57.85	57.40
B I	§Basic slag, 15 20 % (Charleroi) (5)	1.74	1.87	1.91	1.73	2.05	1.50	* 1.95	1.52
	§Superphosphate of lime, 14% (producer's store) (4)	2.50	2.50	2.50	2.50	2.50	2.45	2.50	2.41
	Sylvinit-Kainite, minimum 14 %	29.25	28.25	28.25	27.25	28.85	28.85	28.65	29.00
	§Nitrate of soda, 15 1/2 %	115.25	111.25	110.25	108.25	109.25	112.60	110.90	113.75
	§Sulphate of ammonia, 20 %	100.00	96.00	95.00	93.00	96.00	97.35	95.65	98.50
B II	Maize, Plata (Antwerpen)	125.70	111.35	123.75	82.90	82.40	98.65	85.70	103.55
	Linseed cake imported	145.50	138.00	* 138.00	109.50	116.25	117.50	114.60	117.85
	Coconut cake imported	137.50	n. q.	* 136.00	103.00	99.60	117.35	100.35	116.25
	Groundnut cake imported	149.00	135.00	* 135.00	97.00	103.15	113.65	102.20	* 111.00

* Indicates that the product was not quoted during part of the period under review. — † Indicates that the series is published in the *International Yearbook of Agricultural Statistics* and used in the table of average monthly prices in gold francs per quintal. — § Indicates that the series is published in the *International Yearbook of Agricultural Statistics*.

(1) Prices, for several countries, of plant (A I) and animal (A II) products sold by the farmer; also of fertilizers (B I) and concentrated feedstuffs (B II) bought by the farmer, are published quarterly (Jan., April, July and Oct.). In cases where the market is not indicated, the price is the average for the whole country. — (2) July to June. — (3) Prices per kg. of active fertilizer contained in 100 kg. of commercial fertilizer. — (4) Free at buyer's station.

GROUPS	DESCRIPTION	AVERAGE						Agricultural year	
		Dec.	Nov.	Oct.	July-Sept.	Oct-Dec.	Oct-Dec.	1938-39	1937-38
		1939	1939	1939	1939	1938	1937		
BOHEMIA-MORAVIA (Protectorate) (Prices in crowns per quintal)									
A I	Wheat (Praha) ⁽¹⁾	173.00	172.50	172.00	* 171.25	162.50	162.50	* 163.85	164.05
	Rye (Praha) ⁽¹⁾	149.00	148.50	148.00	* 147.25	142.50	136.50	* 142.80	138.54
	†Barley, malting (Praha) ⁽¹⁾	147.00	146.00	145.00	* 143.50	133.00	133.00	* 133.65	133.65
	Oats (Praha) ⁽¹⁾	121.00	120.50	120.00	* 119.25	120.65	120.65	* 122.10	122.10
	Potatoes, edible (Praha)	...	...	...	82.50	34.50	21.50	40.50	28.35
	Hops (Zatec)	...	...	...	* 4,485.00	1,851.65	1,665.00	2,943.75	1,586.25
A II	Beef, dead weight (Praha)	...	...	...	* 1,150.00	1,034.15	979.00	986.45	939.75
	Veal, dead weight (Praha)	...	...	...	* 1,000.00	833.35	800.00	816.65	763.50
	Pork, dead weight (Praha)	...	...	1,200.00	1,200.00	1,158.35	930.00	1,107.30	867.65
	Butter (Praha)	...	...	...	* 2,350.00	2,200.00	1,925.00	2,172.90	1,889.60
	Eggs (Praha) per 100	...	...	...	63.75	66.65	66.10	62.10	57.55
B I	Basic slag, 15 %	...	...	...	...	36.50	35.75	36.50	35.95
	Superphosphate, 16-18 %	...	...	...	...	55.65	53.15	55.65	54.00
	Kainite, 14 %	...	...	...	...	24.45	24.40	27.20	24.00
	Nitrate of soda	...	...	...	...	n. q.	n. q.	* 138.00	138.00
	Sulphate of ammonia, 20 ½ %	...	...	...	...	123.40	121.05	120.50	122.40
B II	Maize, imported	...	...	...	130.00	110.65	108.50	126.00	129.00
	Wheat-bran (Praha) ⁽¹⁾	115.00	115.00	115.00	111.65	105.00	105.00	105.00	105.00
	Rye-bran (Praha) ⁽¹⁾	113.00	113.00	113.00	109.65	103.00	103.00	103.00	103.00
	Crushed soya (Praha, delivered Lovosice) ⁽²⁾	139.65	142.00	142.00	142.00	142.00
	Rapeseed cake (Praha, delivered Lovosice) ⁽²⁾	* 114.00	* 114.00	* 114.00	115.15	117.50	117.50	117.50	117.50
	Linseed cake (Praha, delivered Lovosice) ⁽²⁾	* 136.00	* 136.00	* 136.00	137.15	139.50	139.50	139.50	139.50
	Groundnut cake (Praha, delivered Strekov) ⁽²⁾	147.65	150.00	150.00	150.00	150.00
DENMARK (Prices in Danish crowns per quintal)									
A I	Wheat (København)	* 19.12	18.32	17.93	16.33	13.83	18.53	* 14.34	18.06
	Barley (København)	* 18.19	17.81	* 16.93	13.49	11.84	18.22	12.12	17.26
	Oats (København)	* 19.15	18.37	17.56	14.40	11.25	15.77	12.14	15.93
A II	§Cows, live weight (København)	* 45.00	47.50	49.75	51.30	38.67	41.50	42.63	40.36
	†Pork, dead weight	194.00	179.00	165.00	173.4	166.83	170.00	171.27	177.16
	Fresh milk	15.48	14.56	14.28	14.02	14.28	13.81	14.23	13.85
	†Butter (København)	268.00	244.60	240.00	229.98	245.92	270.37	237.95	235.55
	Whole milk cheese (Odense)	160.00	149.00	145.00	132.08	140.00	137.50	137.60	133.30
	†Eggs, for export.	149.60	191.50	130.00	112.37	240.67	163.50	112.26	119.37
B I	§Superphosphate, 18 %	n. q.	n. q.	n. q.	* 6.30	6.47	6.49	6.62	6.61
	Potash salts, 40 %	n. q.	n. q.	n. q.	* 12.70	13.12	13.12	13.49	13.49
	Sulphate of ammonia, 20.8 %	n. q.	n. q.	n. q.	* 15.75	16.25	16.25	15.57	16.50
	§Nitrate of lime, 15 ¼ %	n. q.	n. q.	n. q.	* 15.70	16.20	16.20	16.52	16.45
B II	Rye, imported (Jutland)	20.55	* 20.50	n. q.	15.03	14.44	18.58	14.48	17.81
	Maize, Plata (Jutland)	20.00	* 20.00	n. q.	14.26	15.32	15.93	15.35	16.13
	Wheat-bran, Danish (København)	18.22	* 17.80	n. q.	10.90	10.37	14.85	11.26	14.89
	Cottonseed cake (København)	24.85	* 25.00	n. q.	14.66	14.43	17.01	14.66	16.24
	Sunflower-seed cake (København)	24.60	* 24.50	n. q.	15.28	16.13	17.83	15.70	17.01
	Groundnut cake (København)	27.05	n. q.	n. q.	15.69	16.61	17.80	16.04	17.26
	Crushed soya extraction residue (København)	25.90	* 26.00	n. q.	16.78	16.38	17.69	16.35	17.24
FRANCE (Prices in francs per quintal)									
A I	†Wheat (Paris)	203.50	202.00	200.50	210.15	203.00	183.00	205.35	183.90
	Rye (Paris) ^(2*)	136.00	112.00	97.00	98.00	124.65	140.00	125.50	142.80
	Barley, malting (Paris) ^(2*)	124.00	116.00	* 97.00	* 94.15	124.15	170.65	123.70	171.05
	†Oats (Paris) ⁽²⁾	87.00	83.00	69.00	64.40	98.30	126.25	101.00	127.30
	§Wine, red, 10° (Montpellier) per hectolitre	...	...	...	165.50	155.00	149.00	162.00	155.00
A II	†Beef, dead weight, 1st quality (Paris)	1,387.00	1,191.00	1,088.00	1,155.00	1,000.65	1,016.65	1,010.00	1,042.00
	†Mutton, dead weight, 1st quality (Paris)	1,931.00	1,816.00	1,770.00	1,956.00	1,870.65	1,606.35	1,864.00	1,656.00
	†Pigs, live weight (Paris)	906.00	884.00	276.00	975.00	969.00	719.65	935.00	784.00
	Butter (Paris)	2,726.00	2,056.00	1,692.00	1,742.00	* 1,685.00	...	* 2,540.00	...
	"Comté", cheese (Paris)	1,739.00	1,671.00	1,226.00	1,080.00	* 1,463.00	...	* 1,380.00	...
	Eggs (Paris) per 100	107.50	100.50	76.30	63.70	* 96.30	...	* 715.00	...

* , †, §: See notes on page 72.

(¹) Producer's fixed prices, f.o.r. Praha. — (²) Until July 1939, wholesalers' selling prices; subsequently, prices between importer and wholesaler. As from Feb. 1939, delivery Praha. — (³) Up to August 1939: quotations on last day of month. — (⁴) Prior to March 1938, quotations on last day of month. — (⁵) As from and October 1939: price in the free market, f.o.r. producing "départements". — (⁶) July and August. — (⁷) Pressed from home-grown seed. — (⁸) Price of last days of October.

GROUPS	DESCRIPTION	AVERAGE						Agricultural year	
		Dec.	Nov.	Oct.	July- Sept.	Oct.- Dec.	Oct.- Dec.		
		1939	1939	1939	1939	1938	1937	1938-39	1937-38

FRANCE (Prices francs per quintal) (continued)

B I	\$Basic slag, 18 % (Thionville) (*)	1.35	1.35	1.35	1.35	1.08	1.03	1.16	1.05
	\$Superphosphate, 14 % (North and East)	46.50	46.50	46.50	46.05	40.75	40.55	42.45	40.75
	\$Sylvinit, rich, 18 % (Upper-Alsace)	14.32	14.32	14.32	14.32	14.32	14.05	14.32	14.20
	\$Nitrate of soda, 15.5 % (Dunkerque, Calais)	146.80	144.90	143.05	140.97	131.85	106.50	134.20	116.05
	\$Sulphate of ammonia, 20.4 %	135.95	134.45	131.80	129.80	127.85	103.15	129.30	119.90
B II	Linseed cake (North)	161.00	156.00	154.50	147.80	158.40	133.15	157.40	134.55
	Coconut cake (Condekerque)	120.00	122.00	120.00	121.60	n. q.	125.00	133.00	125.00
	Groundnut cake (Condekerque)	135.00	130.00	130.00	124.35	135.35	120.85	131.65	120.55

GREAT BRITAIN (Prices in shillings and pence: "A" per cwt; "B" per long ton).

A I	Wheat	...	7/-	5/10	4/7 1/2	4/7 1/4	8 11 3/4	5/0 3/4	8/6 1/2
	Barley, feeding	...	13/5 1/4	11/1 1/2	7/7	8/2 1/4	12/11 1/4	8/2	11/9 1/4
	Oats	...	8/9	7/3 1/4	6/0 1/4	6/1 1/4	8/5 1/4	6/6 1/4	8/6 1/4
	\$Potatoes (London)	...	...	...	4/8 1/4	6/7	5/6 1/4	7/1 1/4	...
A II	Beef, dead weight (London)	...	...	...	75/11	64/10	67/5	69/5	72/7
	Mutton, dead weight (London)	...	...	...	69/5	62/7	78/-	70/3	76 8
	Pork, dead weight (London)	...	...	...	76/10	81/6	86/10	80/9	80/9
	Butter (London)	152/-	152/-	152/-	140/5	127/-	145/5	134/2	13/-
	Cheese, Cheddar (London)	...	88/-	88/-	84/7	89/7	93/7	90/4	94/9
	Eggs, National Mark, (London) per 100	...	22/6	19/2	15/3 1/4	19/6 1/4	19/10	14/7 1/4	14/10 1/4
B I	\$Basic slag, 14 % (London)	...	...	...	46/-	46/-	46/-	46/-	45.3
	\$Superphosphate, 16 % (London)	...	...	...	59/-	59/-	60/-	59/6	60/9
	Kainite, 14 % (London)	...	...	...	55/-	55/-	55/-	55/-	55
	\$Nitrate of soda, 15 1/2 % (London)	...	...	...	165/-	160/-	160/-	160/-	159/4
	\$Sulphate of ammonia, 20.6 % (London)	...	...	...	148/6	147/8	147/8	150/4	149/7
B II	Bran, British (London)	127/6	127/6	127/6	108/7	120/-	156/-	119/4	150/7
	Bran, middlings, imported (London)	125/-	125/-	125/-	109/5	112.2	159/1	113/8	155/11
	Linseed cake, English (London)	190/-	190/-	190/-	189/3	196/7	211/7	197/1	208/3
	Cottonseed cake (London)	115/-	115/-	115/-	105/6	121/9	114/3	117/11	111/10
	Palm-kernel cake (Liverpool)	135/-	135/-	135/-	131/7	150/3	n. q.	145/3	148/4
	Coconut cake (Liverpool)	150/-	150/-	150/-	142/6	151/2	153/10	149/3	154/1
	Groundnut cake (London)	155/-	155/-	155/-	140/3	143/4	156/7	143/10	152/-

ITALY (Prices in lire per quintal)

A I	Wheat, soft (Milano)	148.00	148.00	148.00	148.00	148.00	138.00	148.00	138.85
	Wheat, hard (Catania)	157.00	157.00	157.00	157.00	157.00	147.00	157.00	148.40
	Oats (Milano)	127.50	107.50	107.50	104.15	97.50	101.50	97.05	101.00
	Maize (Milano)	108.00	108.00	108.00	n. q.	90.00	84.65	90.00	84.35
	Rice, Vialone (Milano)	270.20	269.00	269.00	254.00	248.15	238.00	249.30	227.80
	Rice, Maratelli (Milano)	205.20	204.00	204.00	199.00	193.15	183.50	193.60	180.20
	Rice, Originario (Milano)	174.20	173.00	173.00	168.95	163.55	156.40	163.45	149.90
	Hemp, fibre (Milano)	...	...	...	590.00	590.00	590.00	590.00	582.35
	Olive oil "Soprafino locale" (Bari)	777.00	777.00	745.00	742.00	707.35	684.00	712.00	699.00
	Wine, ordinary, 1 ^{re} (Bari) per hectolitre	...	...	...	...	125.65	95.85	117.60	97.55
A II	Oxen, live weight, 1st quality (Milano)	500.00	483.75	486.00	478.15	435.00	509.00	458.30	462.10
	Lambs, dead weight (Roma)	733.90	619.60	770.60	885.80	673.35	754.90	725.85	791.60
	Pigs, live weight (Milano) (*)	680.00	666.25	657.50	640.05	517.00	630.00	537.50	599.50
	Cheese, Parmigiano-Reggiano (Milano)	1,284.00	1,265.00	1,010.00	1,157.50	1,108.35	1,066.65	1,205.75	1,100.00
	Eggs (Milano) per 100	69.60	78.50	66.85	52.05	67.30	65.15	53.20	49.45
	Wool, Italian (Roma)	2,602.00	2,602.00	2,602.00	2,602.00	2,602.00	2,602.00	2,602.00	2,602.00

*, †, §: see notes on page 72.

(*) Prices per kg. of active fertilizer contained in 100 kg. of commercial fertilizer. — (†) Prior to Feb. 1938, pigs weighing more than 150 kg.; subsequently, pigs of more than 180 kg. — (‡) July and August.

GROUPS	DESCRIPTION	AVERAGE							Agricultural year	
		Dec.	Nov.	Oct.	July- Sept	Oct - Dec	Oct - Dec			
		1939	1939	1939	1939	1938	1937	1938-39	1937-38	
ITALY (Prices in lire per quintal) (continued)										
B I	\$Superphosphate of lime, 14-16 % (Milano) . . .	24 75	24 75	24 75	24 75	24 75	24 75	24 75 *	24 35	
	Chloride of potash, 50 % (Milano)	74 50	74 50	73 75	71 50	71 50	70 90	71 50	71 10	
	\$Nitrate of lime, 15-16 % (Milano)	85 05	83 15	83 20	87 45	91 15	91 15	92 35	92 15	
	Sulphate of ammonia, 20-21 % (Milano)	81 25	80 30	80 85	84 35	86 80	86 80	88 10	87 75	
	\$Cyanamide of calcium, 15-16 % (Milano)	64 85	63 70	64 35	67 85	69 15	69 65	70 40	70 15	
	\$Copper sulphate, 98-99 % (Genova) . . . . .	...	...	...	n. q.	n. q.	n. q.	189 30 *	198 00
B II	Wheat-bran (Genova)	60 00	60 00	60 00	60 00	60 00	60 35	60 00	57 15	
	Rice-bran (Milano)	80 00	80 00	80 00	80 00	74 35	60 80	74 35	58 75	
	Linseed cake (Milano) (1)	81 00	81 00	81 00	81 00	81 00	85 50	81 00	85 50	
	Groundnut cake (Milano) (1)	65 00	65 00	65 00	65 00	63 00	55 00	62 00	55 00	
	Rapeseed cake (Milano) (1)	36 00	36 00	36 00	36 00	36 00	36 50	36 00	36 50	

NETHERLANDS (Prices in florins per quintal)

A I	Wheat (2) . . .	11 70	11 55	11 40	10 97	9 55	9 56	10 05	9 98
	Rye (Groningen) (2) . . .	9 03	9 00	9 00	8 82	7 31	7 36	7 68 *	7 12
	Barley (Groningen) (2) . . .	9 00	9 00	9 00	8 36	7 89	7 17	7 66	7 03
	Oats (Groningen) (2) . . .	8 00	8 00	8 00	7 44	6 12	5 92	6 45	6 17
	Peas (Rotterdam) (2) . . .	10 65	10 55	10 45	10 67	11 24	15 61	11 81 *	14 69
	Flax, fibre (Rotterdam) . . .	110 00	106 00	85 00	70 33	71 17	71 33 *	71 04 *	68 73
	Potatoes (Amsterdam) . . .	4 05	4 09	3 75	3 93	3 98	3 76 *	4 16	5 14
A II	Beef, dead weight (Rotterdam) . . .	77 00	75 00	78 00	72 67	71 50	75 33	72 87	76 29
	Pigs, live weight (Rotterdam) . . .	62 00	64 00	66 00	52 00	51 33	62 33	49 50	57 29
	Butter for export (Leeuwarden) . . .	80 00	80 00	80 00	73 54	77 67	92 66	77 87	84 50
	Cheese, Edam 40 % (Alkmaar) . . .	41 40	41 25	51 88	37 10	44 40	43 99	40 06	42 23
	Cheese, Gouda 45 % (Gouda) . . .	59 90	65 62	69 62	51 06	54 71	58 70	50 26	53 60
	Eggs, for export (Roermond) per 100 . . .	4 18	5 28	4 32	3 37	4 37	4 48	3 76	3 62
B I	Basic slag, 16 % (Zwolle) . . .	2 38	2 48	2 51	2 22	2 28	1 72	2 19	1 77
	Superphosphate, 14 % (Zwolle) . . .	2 24	2 24	2 00	1 70	1 65	1 95	1 66	1 92
	Kainite, 14 % (Zwolle) . . .	1 65	1 65	1 65	1 60	1 61	1 65	1 63	1 63
	Nitrate of soda, 15 1/2 % (Zwolle) . . .	6 36	6 25	6 20	6 23	6 19	6 21	6 32	6 33
	Sulphate of ammonia, 20 % (Zwolle) . . .	5 30	5 15	5 40	5 35	5 30	5 25	5 47	5 38
B II	Maize (Rotterdam) . . .	8 32	8 32	8 29	7 62	7 88	6 87	8 00	7 39
	Linseed cake, Dutch (Rotterdam) . . .	n. q.	n. q.	n. q.	8 26	7 80	9 10	8 65	8 91
	Coconut cake, (Rotterdam) . . .	n. q.	n. q.	n. q.	7 68	7 85	8 42	7 90	8 31
	Groundnut cake, (Rotterdam) . . .	8 40	8 40	8 40	8 05	7 82	7 95	7 91	7 87
	Crushed soya extraction residue (Zwijndrecht) . . .	8 00	8 00	8 00	7 80	8 07	7 64	7 81	7 94

SWEDEN (Prices in Swedish crowns per quintal)

A I	Wheat (Stockholm) . . .	20 12	19 93	18 56	16 84	17 00	19 64 *	17 36 *	20 15
	Rye (Stockholm) . . .	20 25	20 03	18 37	16 36	16 53	18 90 *	16 66 *	18 79
	Barley . . .	...	17 50	16 87	13 97	13 37	17 97 *	13 44 *	17 97
	Oats (Stockholm) . . .	15 65	15 09	14 37	n. q.	11 43 *	14 70 *	11 40 *	14 68
A II	Cows, live weight (Stockholm) . . .	...	70 00	72 00	71 00	61 67	58 67	63 17	59 10
	Pigs, live weight (Goteborg) . . .	...	105 00	103 00	102 00	105 67	103 00	102 58	98 40
	Butter (Malmö), prices for the home market . . .	300 00	300 00	300 00	300 00	269 00	268 33	271 08	267 96
	Butter (Malmö), prices for export . . .	...	198 00	200 00	196 65	214 65	237 65	206 60	206 30
	Eggs (Stockholm) . . .	160 60	195 00	181 00	134 17	169 67	177 50	135 92	137 20
B I	Superphosphate, 20 % . . .	...	...	...	7 20	7 20	7 20	7 25	7 37
	Potash salts, 40 % . . .	...	...	...	12 10	12 10	12 60	12 32	12 72
	Nitrate of soda, 15 1/2 % - 16 % . . .	...	...	...	17 25	17 65	17 05	17 45	17 39
	Nitrate cyanamide, 15 1/2 % . . .	...	...	...	16 55	16 95	16 35	16 75	16 61
B II	Maize, Plata . . .	n. q.	n. q.	20 69	18 45	17 05	17 12	17 43	16 92
	Wheat-bran . . .	16 12	15 75	14 93	13 04	13 12	14 10	12 98	14 14
	Groundnut cake . . .	24 50	24 50	24 50	21 37	20 50	19 97	20 14	19 52
	Cottonseed cake . . .	23 00	23 00	23 00	20 99	19 78	19 56	19 33	18 98
	Soya meal . . .	23 00	23 00	23 00	22 09	20 64	19 51	20 35	19 08

*, \$, † See notes on p. 72.

(1) Linseed cake and rapeseed cake, as from July 1938, and groundnut cake, as from Jan 1939 prices free at factory —
(†) Fixed prices. — (1) As from Sept. 1939: fixed prices, free at producer's station

AVERAGE MONTHLY PRICES IN GOLD FRANCS PER QUINTAL (1)

DESCRIPTION	Dec	Nov.	Oct.	Sept.	August	July	Dec.	Dec.	Year	
	1939	1939	1939	1939	1939	1939	1938	1937	1938	1937
Wheat.										
Budapest: Tisza	11.27	11.16	11.10	11.06	11.84	11.82	12.31	12.62	12.89	12.42
Winnipeg: No. 1 Manitoba	8.05	6.93	7.05	7.47	6.07	6.15	6.76	15.55	11.35	15.02
Chicago: No. 2 Hard Winter	11.46	10.22	9.84	9.73	7.76	7.72	7.56	12.08	9.02	13.81
Buenos Aires: No. 2 Hard	6.35	5.05	5.14	5.66	6.69	6.69	5.76	11.94	9.15	13.58
Karachi: White Karachi	10.05	8.91	7.97	7.92	7.94	7.63	8.52	11.37	8.77	12.10
Berlin: Home-grown	25.19	24.95	24.70	23.12	24.21	23.96	25.32	25.44	25.15	25.37
Antwerpen:										
No. 1 Manitoba (Atlantic)	14.22	11.90	13.06	11.87	8.46	8.52	9.21	18.80	14.74	17.60
Bahia	13.21	10.56	10.80	10.03	6.82	6.89	8.10	16.09	11.16	15.94
Paris: Home grown	13.87	13.77	13.93	13.96	17.43	17.41	16.47	19.12	17.17	20.19
Liverpool and London (c. i. f.) (2):										
No. 1 North. Manitoba (Pacific)	10.07	9.74	8.93	* 9.02	7.45	7.74	8.59	19.00	* 13.34	* 17.69
No. 3 North. Manitoba (Pacific)	9.72	9.27	8.09	* 8.17	6.47	6.78	7.94	15.85	11.78	16.16
No. 2 Hard Winter	7.79	7.51	6.82	* 6.89	n. q.	6.24	* 6.99	13.77	11.48	* 15.18
Rosafé	7.45	7.14	6.33	* 6.39	5.87	5.95	7.38	13.84	10.93	* 14.37
Choice White Karachi	7.58	7.31	6.61	* 6.68	n. q.	n. q.	n. q.	13.05	10.80	14.97
West Australian (cargoes)	7.65	7.39	6.75	* 6.82	6.32	6.61	7.60	13.04	10.61	15.24
Milano: Home-grown, soft	22.88	22.88	22.88	23.42	23.83	23.83	23.83	22.22	23.16	21.28
Rye.										
Berlin: Home-grown	23.09	22.85	22.60	21.14	22.11	21.86	23.09	23.46	22.86	22.01
Budapest: Home-grown	8.41	8.11	7.77	7.87	8.52	8.02	8.57	11.46	10.19	11.65
Minneapolis: No. 2 rye . . . . .	...	6.10	6.27	6.16	4.96	5.15	5.15	8.38	6.50	11.17
Barley.										
Bralla: Home-grown	9.45	9.36	8.31	7.23	6.18	6.63	8.03	8.40	7.79	* 7.96
Praha: Home-grown, malting	18.15	18.03	17.91	16.82	17.66	n. q.	14.06	14.40	* 14.20	* 14.45
Winnipeg: No. 4 Western . . . . .	...	...	5.14	5.48	4.30	4.23	4.84	7.98	6.49	9.20
Minneapolis: No. 2 Feeding . . . . .	...	6.12	6.15	6.03	5.03	5.27	5.69	7.70	6.62	9.29
Berlin: Home-grown, fodder	21.24	20.99	20.75	19.39	20.25	20.01	21.24	21.24	20.98	21.16
Antwerpen: Danubian	12.96	11.34	12.30	10.21	6.57	6.94	8.10	10.88	9.76	11.48
Liverpool and London (c. i. f.) (2):										
No. 3 Canadian Western	7.94	7.94	7.64	7.72	6.76	6.70	7.98	n. 11.85	9.34	* 11.86
Plata	7.37	7.37	n. q.	n. q.	6.69	6.69	n. q.	10.76	* 11.44	11.17
Iraqian	7.37	7.10	6.41	6.48	* 6.38	6.35	7.72	10.90	8.77	10.74
Oats.										
Winnipeg: No. 2 White . . . . .	...	5.61	5.79	6.52	5.33	5.18	5.60	9.75	8.20	10.78
Chicago: No. 2 White	8.75	8.33	7.54	7.59	6.62	6.35	6.62	6.98	6.34	9.25
Buenos Aires: No. 2 White	4.19	4.17	4.40	4.49	3.96	3.94	4.58	6.31	6.01	6.41
Berlin: Home-grown	21.37	21.24	21.12	19.86	20.87	22.35	21.61	20.62	21.24	20.74
Paris: Home-grown (2)	5.93	5.66	* 4.79	...	5.02	5.38	7.64	13.08	10.52	15.24
London and Liverpool (c. i. f.) (2): Plata	n. q.	n. q.	n. q.	n. q.	5.37	5.35	6.31	8.37	7.61	8.82

(1) The gold franc adopted is that of the former Latin Monetary Union. Original prices have been converted into American dollars, and multiplied by 3.061, which is the coefficient existing between the current dollar and the former franc of the Latin Monetary Union. — (2) Selling prices applied by Port Area Grain Committees. — (3) See note 5 on page 73.

DESCRIPTION	Dec.	Nov.	Oct.	Sept.	August	July	Dec.	Dec	Year	
	1939	1939	1939	1939	1939	1939	1938	1937	1938	1937
Maize.										
Braila: Home-grown	6.55	7.27	6.61	7.99	8.86	8.64	8.64	6.66	7.50 *	6.97
Chicago: No. 3 Yellow	6.78	6.00	5.90	6.69	5.30	5.38	6.16	6.88	6.58	12.39
Buenos Aires: Yellow Plata	5.58	5.68	5.68	5.90	5.67	5.61	6.94	8.82	7.77	6.87
Liverpool and London (c.i.f.) (1):										
Yellow Plata	8.27	7.96	7.17	7.25	7.08	6.89	8.67	10.51	9.40	9.18
No. 2 White African	8.27	7.89	6.89	6.96	6.90	6.98	n. q.	10.05	n. q. *	9.49
Milano: Home-grown	16.70	16.70	16.70	n. q.	n. q.	n. q.	14.49	13.85	14.10	13.32
Rice.										
Milano: Originario	26.93	26.75	24.71	26.89	27.14	27.14	26.12	25.04	25.59	21.98
Rangoon: No. 2 Burma	7.64	8.32	8.30	7.78	7.65	7.65	6.72	8.55	8.41	8.83
Saigon: No. 1 Round white	8.06	6.34	5.91	5.99	6.83	7.10	7.01	9.60	9.34	9.54
Tokyo: Tynmai . . . . .	...	20.63	18.86	18.78	21.46	20.84	20.13	20.29	20.40	19.52
Cotton.										
New Orleans: Middling	n. 71.80	n. 63.30	n. 60.26	60.87	60.53	63.23	57.29	56.35	58.99	76.31
Bombay (futures): Broach, f.g.	78.80	59.25	50.91	51.55	47.51	47.25	47.66	54.33	50.05	65.94
Alexandria: Sakellaridis, f.g.f.	113.09	83.91	74.26	81.48	78.99	74.86	83.08	103.13	90.38	124.34
Liverpool:										
Middling American	93.11	76.78	71.55	75.83	68.91	71.65	67.57	66.87	67.84	88.48
Broach, f.g. . . . .	...	n. 65.64	n. 59.40	n. 61.16	n. 52.63	n. 52.82	51.96	54.37	n. 53.57	n. 71.77
Giza 7, f.g.f. (2)	108.56	87.49	84.83	92.43	87.80	85.75	100.90	113.80	109.98	136.86
Beef.										
Berlin: Home-grown (live weight) . . . .	...	109.91	109.91	103.96	109.91	107.44	107.69	103.74	104.81	103.92
Paris: Home-grown (dead weight)	94.52	81.17	75.59	79.67	93.70	94.28	80.29	111.19	90.87	119.65
London: Home-grown (dead weight) . . . .	...	...	...	...	105.02	108.25	92.66	109.75	104.77	103.99
Mutton.										
Paris: Home-grown (dead weight)	131.60	123.76	122.98	133.67	160.28	159.57	154.46	178.12	152.56	194.24
London: Home-grown (dead weight) . . . .	...	...	...	...	94.44	100.43	91.02	115.02	99.31	133.21
Pork.										
Denmark: Home-grown (dead weight) . .	114.85	105.97	97.68	100.75	112.90	111.36	105.83	117.09	117.30	115.20
Rotterdam: Home-grown (live weight) . .	100.81	104.00	107.25	88.12	83.50	81.47	83.18	107.22	90.30	89.76
Berlin: Home-grown (live weight) . . . .	...	129.67	129.67	122.89	132.14	128.44	124.73	124.73	125.56	124.77
Paris: Home-grown (live weight)	61.74	60.24	53.92	64.94	80.58	80.84	78.44	74.93	78.13	83.90
London: Home-grown (dead weight) . . . .	...	...	...	...	107.05	108.66	116.44	129.07	117.28	117.04
Bacon.										
London:										
English, No. 1, lean sizable . . . . .	...	129.42	131.99	121.81	138.18	138.31	137.77	147.77	146.00	140.67
Danish No. 1, sizable . . . . .	...	131.48	134.10	121.81	138.18	138.31	130.60	147.27	146.28	140.15

(1) See note 2 on preceding page. — (2) Before July 1939: Sakellaridis f.g.f.

DESCRIPTION	Dec.	Nov.	Oct.	Sept.	August	July	Dec.	Dec.	Year	
	1939	1939	1939	1939	1939	1939	1938	1937	1938	1937
Butter.										
Köbenhavn: Danish	158 66	144.80	142.08	142.24	142.85	145.12	165 75	189.14	153.83	151.84
Leeuwarden: Dutch	130 08	130.00	130 00	119.12	117.48	123.83	138 09	142 31	135.22	130.90
Germany: Butter with National mark.	338.39	338.39	338.39	320.06	338.39	338.39	338.39	328.51	330.60	328.51
London:										
Danish	171.39	171.39	174 78	175.21	174.46	181.12	202.55	228 30	191.35	189.35
Argentine	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	141 99	162 82	148.98	139.78
Australian, salted	171 39	171.39	174 78	160.79	153.18	161.01	150.42	167.09	169.20	163.38
New Zealand, salted	171.39	171.39	174.78	164.65	165.74	173.95	153 82	169.85	172.59	164.51
Cheese.										
Milano: Parmigiano-Reggiano	198.51	195 57	156 15	158.25	199.69	198.48	186.81	185 20	191.77	155.26
Alkmaar: Edam 40 +	67.32	67 01	84.30	75.55	52 29	53.96	68.54	70.80	71.84	66 48
Kempten: Emmenthal.	205.01	205.01	205.01	193.90	205 01	201.30	197.60	197.60	197.60	197 60
London:										
English Cheddar . . . . .	...	104.02	106.08	104.96	115.84	n. q.	127.69	143.63	135.31	133.27
Canadian . . . . .	...	92.20	78.95	76.44	87.47	105.26	100 51	109 38	110.93	109 55
New Zealand . . . . .	...	88 64	76 54	74.31	81.77	88.91	97.23	98 97	102 32	99 11
Eggs (per 100).										
Denmark: Danish, for export (per quintal)	88.56	113 37	77 20	74.68	76.48	58.62	79.69	113 31	77 72	73 92
Roermond: Dutch, for export	6.70	8.58	7.02	5.74	6.00	4.79	7 05	8 25	6.14	6.11
Berlin: German, marked "GIB" . . . .	...	14.20	12 97	12.27	12.97	12.97	15 44	12 66	13 00	11.83
London:										
English . . . . .	...	13.51	11 74	10 70	10.93	9 41	13.19	15 13	11 04	10 88
Danish . . . . .	...	9 76	7.99	7.15	7.10	6.24	8 83	11 26	7.84	7.71
Dutch . . . . .	...	9.76	7.99	7.41	7.87	7.67	10 17	11.63	8.89	8 90

Cotton stocks at Bombay, Alexandria and Port Sudan.

LOCATION	Thursday nearest 1st of month ⁽¹⁾				
	January 1940	December 1939	November 1939	January 1939	January 1938
	thousand centals				
Bombay ⁽²⁾	2,490	2,037	2,125	2,750	2,228
Alexandria ⁽³⁾	2,788	2,302	1,619	3,316	2,443
Port Sudan . . . . .	...	392	331	277	185

⁽¹⁾ Stocks held by exporters, dealers and millers. — ⁽²⁾ Quantities consumed in Alexandria, or returned to the interior of the country, are not included. — ⁽³⁾ For Port Sudan the data refer to the last day of the preceding month

AUTHORITIES: East Indian Cotton Assn. and Commission de la Bourse de Mind-el-Bassal.

INDEX-NUMBERS OF PRICES OF AGRICULTURAL PRODUCTS
AND OF COMMODITIES BOUGHT BY THE FARMER

DESCRIPTION	Dec	Nov.	Oct.	Sept.	August	July	Dec	Dec	YEAR	
	1939	1939	1939	1939	1939	1939	1938	1937	1938-39 (*)	1937-38 (*)
Germany										
(Statistisches Reichsamt, products sold by farmers)										
Average for corresponding months 1900-10/1913-14 = 100.										
Cereals	113	112	109	108	110	101	112	113	111	110
Edible potatoes	111	108	108	110	134	141	111	106	116	114
Plant products	113	111	109	108	116	118	112	113	112	111
Meat animals	97	96	95	95	97	98	96	93	97	95
Livestock products (butter and eggs)	108	106	105	109	114	122	108	102	111	109
Livestock and livestock products	100	99	98	99	102	106	99	96	101	99
Total agricultural products	104	103	102	102	106	108	103	101	104	102
Germany										
(Statistisches Reichsamt, wholesale products)										
1913 = 100.										
Foodstuffs of plant origin	107.6	107.5	107.5	107.6	108.8	108.7	107.2	104.6	105.9	104.6
Fertilizers	—	52.9	52.9	53.7	53.1	52.0	55.1	55.5	55.3	57.0
Agricultural dead stock	—	110.8	110.9	110.8	110.8	110.7	110.8	112.7	111.3	112.7
Consumption goods (*)	137.0	136.7	136.3	136.2	136.1	135.8	135.1	135.8	135.4	133.3
Wholesale products in general	107.6	107.4	107.1	106.9	107.1	107.0	106.3	105.5	105.7	105.9
England and Wales (*)										
(Ministry of Agriculture and Fisheries)										
Average 1927-1929 = 100.										
A: UNCORRECTED FOR SEASONAL VARIATION										
Cereals and farm crops	—	95	91	89	78	83	76	91	86 1/2	98 1/2
Livestock and livestock products	—	107	96	92	87	85	98	105	88	88
Total agricultural products	—	105	96	92	85	85	94	102	90	90 1/2
Wholesale products in general (*)	103.6	100.4	94.8	90.1	84.1	84.1	84.2	92.2	86.9	93.1
B: CORRECTED FOR SEASONAL VARIATION										
Cereals and farm crops	—	95	90	88	77	83	77	92	—	—
Livestock and livestock products	—	98	92	94	93	95	89	94	—	—
Total agricultural products	—	97	91	93	91	93	86	94	—	—

(*) Household goods of all kinds, and clothing. — (*) Index-numbers taking account of payments under the Wheat Act, the Cattle Subsidy Act, and Government payments for milk. — (*) Index-numbers by the Board of Trade, reduced to 1927-1929=100. — (*) Agricultural year: July 1-June 30.

DESCRIPTION	Dec.	Nov.	Oct.	Sept.	August	July	Dec.	Dec.	YEAR	
	1939	1939	1939	1939	1939	1939	1938	1937	1938	1937
Argentina										
(Banco Central de la Republica Argentina) 1926 = 100.										
Cereals and linseed	85.0	80.7	80.3	83.9	73.7	73.4	77.2	105.3	90.6	101.3
Meat	105.1	108.9	103.9	92.9	93.7	93.0	86.2	101.4	94.8	93.6
Hides and skins	112.3	103.6	106.8	106.3	76.8	79.6	87.9	93.2	81.9	118.6
Wool	131.8	131.9	135.1	134.5	94.2	97.3	84.9	106.5	92.5	143.7
Dairy products	82.0	87.3	92.2	88.2	84.0	83.9	63.1	82.6	83.9	93.7
Forest products	112.6	109.5	109.5	102.3	101.3	101.5	100.5	99.1	100.0	98.6
Total agricultural products	93.8	90.9	90.7	91.6	79.1	79.2	80.1	102.9	90.6	105.1
Non agricultural commodities	129.1	129.1	126.2	119.3	109.1	109.4	109.1	113.9	109.4	114.4
Wholesale products in general	121.7	121.0	118.7	113.5	102.8	103.0	103.0	111.7	105.5	112.6
Australia (Commonwealth)										
(Commonwealth Bureau of Census and Statistics) 1928-29 = 100.										
Agricultural field products	78.8	...	83.8	78.2	74.8	75.0	80.3	87.9	80.3	84.8
Pastoral products	77.4	...	76.6	72.8	64.1	66.1	67.1	75.5	71.4	79.0
Farmyard and dairy products	85.6	...	85.6	85.2	87.2	87.0	89.3	80.7	89.3	82.9
Total agricultural products	79.4	...	80.7	77.0	72.0	73.0	75.7	80.6	77.8	81.7
Belgium										
(Belgische Boerenbond — Boerenbond belge) Average of corresponding months 1909-1914 = 100.										
Field products . . . . .	...	608	597	535	436	456	489	598	541	577
Livestock products . . . . .	...	634	634	609	623	638	719	686	689	617
Total agricultural products . . . . .	...	626	622	586	564	580	646	655	643	604
Rent . . . . .	...	650	650	650	650	650	650	650	650	647
Agricultural wages . . . . .	...	950	940	935	930	925	900	870	887	851
Fertilizers . . . . .	...	513	495	466	466	461	478	469	471	443
Feedingstuffs . . . . .	...	637	696	637	470	497	574	651	631	610
Total production expenses (including those not specified) . . . . .	...	788	794	779	746	749	751	754	757	736
Bohemia										
(Institute for Farm Accounting and Agricultural Economics) 1913-14 = 100										
A: SUGARBEET REGION										
Plant products . . . . .	...	...	...	...	649	664	591	596	584	576
Livestock products . . . . .	...	...	...	...	718	685	575	537	531	550
Total agricultural products . . . . .	...	...	...	...	677	672	584	572	562	565
Total production expenses . . . . .	...	...	...	...	877	871	805	784	801	783
B: NON-SUGARBEET REGION										
Plant products . . . . .	...	...	...	...	706	721	668	652	656	623
Livestock products . . . . .	...	...	...	...	704	664	556	523	504	539
Total agricultural products . . . . .	...	...	...	...	705	687	601	574	565	572
Total production expenses . . . . .	...	...	...	...	895	889	819	792	811	796

(1) July 1-June 30.

DESCRIPTION	Dec	Nov	Oct	Sept	August	July	Dec	Dec	YEAR	
	1939	1939	1939	1939	1939	1939	1938	1937	1938	1937
Canada										
(Dominion Bureau of Statistics, Internal Trade Branch) 1926 = 100										
Field products (grain, etc.)						55.0	53.8	83.9	69.0	88.3
Livestock and livestock products						75.5	82.8	84.6	81.3	85.0
<i>Total Canadian farm products</i>						62.7	64.6	84.2	73.6	87.1
Fertilizers						82.9	82.8	75.2	78.9	74.5
Consumer goods (other than foodstuffs, beverages and tobacco)						74.7	76.7	78.3	77.2	78.4
<i>Wholesale products in general</i>						72.6	73.3	82.7	78.6	84.6
Chili										
(Dirección General de Estadística) 1913 = 100										
Cereals			446.2	435.3	433.0	438.8	461.5	315.5	551.0	572.3
Other plant products			431.0	405.9	410.0	432.1	359.0	354.2	375.4	375.3
Meat animals			423.3	424.2	398.1	376.0	329.4	389.7	380.3	381.2
Meat			386.7	289.0	280.6	280.6	283.9	333.6	324.7	316.2
<i>Total agricultural products</i>			430.5	405.1	403.1	426.6	379.9	405.6	424.3	430.0
<i>Domestic industrial products</i>			443.4	424.8	424.6	434.1	460.1	473.5	472.5	489.4
<i>Wholesale products in general</i>			523.3	497.1	489.9	500.1	489.9	509.8	510.7	522.6
United States										
(Bureau of Agricultural Economics) Average 1909 to 1913 = 100										
A UNCORRECTED FOR SEASONAL VARIATION										
Cereals	87	79	77	83	64	66	63	86	74	126
Cotton and cottonseed	82	75	74	76	71	73	70	64	70	95
Fruits	63	66	73	73	70	80	73	76	73	122
Meat animals	101	107	112	117	101	107	109	111	114	132
Dairy products	113	117	112	107	100	96	112	136	109	124
Chickens and eggs	97	117	108	102	90	89	127	177	108	111
Miscellaneous	104	98	94	98	100	89	108	118	95	130
<i>Total agricultural products</i>	96	97	97	98	88	89	96	104	95	121
Commodities bought for use in living and production	122	122	122	122	119	120	120	126	123	130
<i>Prices received and taxes paid by farmers</i>	128	128	128	128	125	126	126	131	129	135
<i>Agricultural wages⁽¹⁾</i>	—	—	126	—	—	126	117	118	116	120
B CORRECTED FOR SEASONAL VARIATION										
Cereals	89	82	80	85	64	66	64	88	—	—
Cotton and cottonseed	86	77	75	73	68	71	74	67	—	—
Fruits	73	75	75	75	71	72	81	86	—	—
Truck crops (market garden crops)	96	130	128	114	101	101	108	112	—	—
Meat animals	107	112	113	116	99	105	116	118	—	—
Dairy products	112	113	111	108	104	100	107	129	—	—
Chickens and eggs	76	92	96	101	99	104	98	101	—	—
Miscellaneous	104	95	94	99	93	85	107	117	—	—
<i>Total agricultural products</i>	97	97	96	98	88	88	96	104	—	—
<i>Agricultural wages</i>	—	—	122	—	—	122	—	—	—	—

⁽¹⁾ 1910-1914 = 100 — ⁽²⁾ January succeeding

DESCRIPTION	Dec.	Nov.	Oct.	Sept.	August	July	Dec.	Dec.	YEAR	
	1939	1939	1939	1939	1939	1939	1938	1937	1938	1937
United States										
(Bureau of Labor)										
1926 = 100.										
Grains	71.6	64.1	61.6	65.1	51.5	52.3	54.4	71.5	60.6	98.3
Livestock and poultry	63.8	66.1	70.6	76.3	66.0	69.7	74.4	78.4	79.0	95.5
Other farm products	68.4	68.3	66.1	64.6	60.1	60.7	66.5	69.3	63.9	77.2
Total agricultural products	77.6	67.3	67.1	68.7	61.0	62.6	67.6	72.8	68.5	86.4
Agricultural implements	93.3	93.3	93.4	93.5	93.5	93.4	93.5	96.1	95.5	94.0
Fertilizer materials	74.5	73.0	70.6	69.2	67.2	67.5	68.6	72.0	69.2	71.2
Mixed fertilizers	73.7	72.6	72.6	72.6	72.9	72.6	73.8	74.4	72.2	73.2
Cattle feed	91.7	91.5	82.9	...	68.4	72.4	76.6	81.7	76.9	110.5
Non-agricultural commodities	81.8	81.6	82.0	81.3	77.9	78.1	79.0	83.5	80.6	86.2
Wholesale products in general	79.3	79.2	79.4	79.1	75.0	75.4	77.0	81.7	78.6	86.3
Finland										
(Central Bureau of Statistics)										
1935 = 100										
Agricultural products . . . . .	...	...	...	...	115	115	120	119	117	115
Forestry products . . . . .	...	...	...	...	169	165	146	170	145	165
Feedingstuffs . . . . .	...	...	...	...	127	127	121	139	129	133
Fertilizers . . . . .	...	...	...	...	107	107	105	110	109	109
Wholesale products in general . . . . .	...	...	...	...	117	116	113	122	114	122
Hungary										
(Central Royal Bureau of Statistics)										
1929 = 100.										
Cereals	87.7	86.8	85.1	85.0	94.9	83.9	84.9	91.2	89.1	88.9
Total raw plant products ⁽¹⁾	82.5	79.9	80.0	79.6	81.0	78.8	75.4	72.1	76.9	69.2
Meat animals, meat and lard	65.7	66.6	67.9	69.9	67.4	64.9	66.7	75.9	68.4	75.5
Total livestock products ⁽¹⁾	67.7	68.4	66.8	67.4	66.0	64.6	64.9	70.9	65.6	68.5
Total agricultural products	77.8	76.3	75.9	75.8	76.3	74.3	72.1	71.7	73.4	69.0
Products of agricultural industries	95.7	95.0	93.8	92.7	92.4	91.5	95.3	107.6	103.0	106.2
Industrial raw materials and products	96.0	95.3	94.5	93.4	92.6	92.4	92.6	95.0	93.3	95.2
Wholesale products in general	89.2	88.2	87.5	86.5	86.3	85.3	85.0	87.5	86.8	86.3
Ireland										
(Department of Industry and Commerce)										
Average 1911-1913 = 100.										
Agricultural products in general . . . . .	...	134.2	133.2	126.8	116.3	117.2	113.0	108.3	111.9	104.9

⁽¹⁾ Including unspecified products.

DESCRIPTION	Dec 1937	Nov 1939	Oct 1939	Sept 1939	August 1939	July 1939	June 1938	May 1937	YEAR	
									1938	1937

Lithuania

(Lietuvos Bankas)
1926 1929 = 100

Cereals			46	42	42	43	39	41	41	46
Cattle, fowls			53	52	52	52	53	49	51	49
Leather, hides, wool			57	53	53	52	53	57	51	60
Meat, dairy products and eggs			50	46	45	45	51	49	47	44
Total agricultural products			50	46	46	46	47	46	46	47
Wholesale products in general			56	52	52	52	52	51	51	51

Norway

(Kgl. Statist. for Norges Vel)
Average 1910 1914 = 100

									1938 ()	1937 ()
Cereals	170	170	170	170	162	163	167	175	168	173
Potatoes	206	202	217	184	127	152	134	207	174	188
Lark	159	154	154	152	131	131	133	140	127	117
Other meat	173	166	168	180	163	169	171	189	179	187
Dairy products	193	192	188	179	179	179	177	172	176	165
Eggs	132	165	157	140	129	109	143	153	124	124
Concentrated feed stuffs	170	167	159	151	155	155	157	152	158	152
Maize	177	170	168	153	153	157	158	153	158	149
Fertilizers	11	112	90	90	89	94	92	100	98	95

New Zealand

(Census and Statistics Office)
Average 1910 1913 = 100

									1938	1937
Dairy products			126.2	125.3	125.3	122.5	114.2	120.2	121.0	109.2
Meat			158.1	156.3	157.4	155.9	177.8	188.9	175.2	165.1
Wool			107.1	107.1	114.3	112.6	117.8	129.0	117.6	176.8
Other pastoral products			107.9	98.4	89.0	96.1	90.6	153.7	94.7	153.5
All pastoral and dairy products			129.0	127.6	128.9	127.5	131.7	144.5	134.0	142.3
Field products			154.5	157.8	152.4	160.5	136.3	137.8	139.6	136.5
Total agricultural products			129.6	128.3	129.5	128.3	131.8	144.1	134.2	142.2

Netherlands

(Bureau of Agriculture)
Average 1924-5 to 1928-29 = 100

									1938 ()	1937 ()
Plant products	70	70	68	66	64	54	57	50	54	63
Livestock products	69	70	70	64	62	63	62	67	63	66
Total agricultural products	69	70	69	65	62	61	61	65	62	65
Wholesale products in general (1)	84.7	83.6	80.8	75.4	70.5	70.1	70.6	75.6	71.9	76.2
Agricultural wages	75	75	75	75	75	75	74	68	74	69

(1) Index numbers calculated by the Central Statistical Bureau of the Netherlands base 1920 1933 = () Agricultural year April 1 March 31 — (2) Agricultural year July 1-June 30 — (3) Calendar years 1938 and 1937 respectively

DESCRIPTION	Dec	Nov	Oct	Sept	August	July	Dec	Dec	YEAR	
	1939	1939	1939	1939	1939	1939	1938	1937	1938	1937
Sweden										
(Sveriges Allmänna Lantbrukssällskap)										
Average 1909-1913 = 100										
Cereals	134	133	126	113	104	—	100	121	114	123
Plant products (*)	135	134	127	116	107	115	102	120	115	123
Meat animals	151	152	158	163	156	157	132	128	133	126
Dairy products	183	171	166	158	149	148	163	147	142	134
Livestock and livestock products	174	167	164	158	150	149	155	143	139	132
Total agricultural products	161	156	152	144	136	138	137	135	131	129
Feedingstuffs	165	164	162	155	148	148	143	140	140	139
Fertilizers	102	100	100	93	93	93	93	94	96	94
Building materials	220	220	217	215	212	205	180	194	182	191
Machinery and implements	232	228	228	208	204	204	204	217	218	203
Sundries	151	139	135	127	121	122	119	129	124	127
Total commodities purchased	168	164	163	154	149	149	143	148	146	145
Wholesale products in general		162	159	151	141	138	134	144	137	145
Agricultural wages . . . . .	...	..	..	..	..	...		204	204 ^{b)}	194
Switzerland										
(Schweizerischer Bauernverband)										
1914 = 100										
Slaughter cattle	132	132	129	125	122	122	118	129	117	122
Slaughter pigs	141	143	143	128	118	117	123	127	125	127
Milk (base price)	123	123	117	117	117	117	117	123	120	118
Total agricultural products	132	132	128	124	121	118	119	125	126	125
Feedingstuffs (*)	127	124	121	118	107	103	108	99	105	97
Fertilizers (*)	104	105	109	103	98	97	102	83	96	85
Wholesale products in general ()	125.1	122.6	120.1	116.8	107.4	106.5	106.1	109.6	107.1	111.2
Yugoslavia										
(National Bank of the Kingdom of Yugoslavia)										
1926 = 100										
Plant products	90.7	87.0	76.8	73.5	75.7	78.9	85.2	86.4	85.8	74.1
Livestock products	82.8	80.7	71.0	67.7	68.0	68.0	65.7	67.4	65.8	65.1
Industrial products	91.6	86.5	82.9	79.5	78.3	78.2	76.7	80.4	78.2	77.6
Wholesale products in general	90.9	86.8	80.1	76.6	76.8	77.6	77.5	79.9	78.3	74.7

(*) Including unspecified products — (*) Index numbers calculated by the Bundesamt für Industrie, Gewerbe und Arbeit, base July 1914 — (*) Provisional data

Prof. UGO PAPI, Segretario generale dell'Istituto, Direttore responsabile.

MONTHLY CROP REPORT AND AGRICULTURAL STATISTICS

The following explanations refer to crop conditions quoted in the crop notes and in the tables. — (Crop condition according to the system of the country: Germany, including Ostmark and Sudetenland, Bohemia and Moravia (Protectorate); Hungary and Luxemburg: 1 = excellent, 2 = good, 3 = average, 4 = poor, 5 = very poor; Finland: 8 = very good, 6 = above the average, 5 = average; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = poor; Estonia, Latvia, Lithuania, Poland, Rumania and Sweden: 5 = excellent 4 = good, 3 = average, 2 = poor, 1 = very poor; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; Portugal: 100 = excellent, 80 = good, 60 = average, 40 = poor, 20 = very poor; Switzerland: 100 = excellent, 90 = very good, 75 = good, 60 = fairly good, 50 = average, 40 = rather poor, 30 = poor, 10 = very poor; U. S. S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = poor; Canada: 100 = crop condition promising a yield equivalent to the average yield of a long series of years; United States: 100 = crop condition which promises a normal yield; Egypt: 100 = crop condition which promises a yield equal to the average yield of the last five years. — For other countries the system of the Institute is employed 100 = crop condition which promises a yield equal to the average of the last ten years

NOTE. The countries are listed throughout by continents (Europe, followed by the U. S. S. R., America, Asia, Africa and Oceania) in the French alphabetical order. In the tables the Northern Hemisphere precedes the Southern Hemisphere.

VEGETAL PRODUCTION

WORLD WHEAT PRODUCTION AND TRADE IN 1939-40

Very little new information on the last wheat crop was received by the Institute in February. In Europe, Estonia and Lithuania have published their revised estimates, which may be regarded as definitive or subject to only negligible correction. The new estimates of these two countries are higher than the earlier estimates, so that their wheat production in 1939 is now put at about the very high level of 1938. The rye crop, which in these two countries is larger than that of wheat, is excellent, production being considerably greater than that of 1938 or the preceding five-year average.

Harvesting in the countries of the Southern Hemisphere is being completed and results show considerable variation from those anticipated. Argentina cabled to the Institute on February 15 her second estimate of wheat production. This estimate shows a considerable decrease from the December forecast, which was already a very low figure. The earlier forecast of 147 million bushels has now been reduced to 118 millions, this is the smallest crop in Argentina since the Great War. At the middle of October crops were promising a good yield and at this period production forecasts were about 240 million bushels; crop condition subsequently deteriorated steadily owing to excessive rain, rust and, at harvest time, late frosts, which caused an immediate reduction in yields.

Area, Yield per Acre, Production and net Exports of Wheat in Argentina.

	Area sown	Yield per acre ⁽¹⁾	Production	Net exports ⁽²⁾
	ooo acres	bushels	million bushels	million bushels
Averages:				
1923-24 to 1927-28	18,830	12.1	229	147
1928-29 to 1932-33	20,320	11.9	241	161
1933-34 to 1937-38	17,880	12.3	220	137
Years.				
1938-39	20,870	16.1	336	179
1939-40	17,830	6.6	118	⁽³⁾ 15

(¹) Calculated on the area sown. — (²) Calendar years 1924 and following. — (³) Probable exportable surplus of the new crop.

The new Argentine crop is not only extremely poor in quantity, it is also of very poor quality, the grains having suffered serious damage from frost, and rust and other diseases. It must, however, be noted that Argentina, in spite of her considerable exports in 1939, particularly in the later months, still had at the beginning of 1940 a large stock of old crop wheat, carried over from the excellent crop of 1938-39.

In Uruguay, according to a cable received by the Institute on February 14 from the Uruguayan Government, harvest results show a drop on the forecast: 9.6 million bushels against 11 million bushels. The revised estimate shows a reduction of about 38 per cent. on last year and of 28 per cent. on the average. The new crop is barely sufficient, including stocks carried over, to supply the internal requirements of the country. In Chile, according to the latest reports, harvesting is in progress with favourable weather and results appear satisfactory.

Owing to the poor crops of Argentina and Uruguay, the total production of South America is extremely low; it is the only continent which had a definitely poor crop in 1939, all the other continents having had considerably higher than average outturns.

The first estimate made for the Australian crop by the Dominion Bureau of Statistics in November was 183 million bushels. In publishing this forecast in the November Crop Report, we remarked that the first provisional estimate of Australian production is on the conservative side and generally turns out to be rather considerably smaller than the final figure. This comment now appears justified, for the estimate was raised in January to 187 million bushels and further raised in the recently published February estimate to 210 million bushels. The Australian crop of 1939-40 is thus one of the largest ever obtained, being about a third greater than last year's and the previous five-year average and practically reaching the level of the record crop of 1932-33 (214 million bushels). Moreover, the quality of the grain is good and the specific weight is high. For New Zealand no official forecast of wheat production is yet available, but the considerable increase in the sown acreage, which is about a third larger

than that of last year, and the generally favourable season promise a considerably better than average crop.

In the Union of South Africa the third wheat estimate shows a reduction on the former estimate and production, in spite of the considerable increase in acreage, is barely better than average.

The modifications involved by these revisions in the production of the various continents are fairly considerable, but as the decrease in South America is practically offset by the increase in Oceania, total world wheat production in 1939 remains approximately at the figure given in last month's Crop Report.

Wheat. - World Production by Continents (1).

(million bushels)

YEARS	Europe	North America	South America	Asia	Africa	Oceania	Total	U.S.S.R.
Averages:								
1923-27	1,244	1,210	277	497	108	143	3,480	677
1928-32	1,429	1,288	290	535	128	189	3,859	797
1933-37	1,580	901	278	581	133	166	3,639	1,205
Years:								
1938	1,829	1,295	400	680	140	160	4,504	1,494
1939 (forecast)	1,665	1,260	180	683	170	220	4,178	...

(1) Excluding U. S. S. R., China, Iran and Iraq

The increasing lack of statistics of foreign trade makes it extremely difficult to follow international wheat trade movements this season. The statistics of Australian exports have not been received either for November or for December. Owing to the lack of these important data, it was necessary to consider the abandonment of the table of world wheat trade. It has, however, been preferred to continue temporarily the publication of these figures, incomplete and retarded as they are, in the case of certain countries, in the hope that the missing data may be filled in after an interval, when the delay in publication of the figures will have removed their confidential character. In the following table we give the figures of exports from August to December of the principal exporting countries, inserting for Australia the official statistics from August to October, but not filling in the last two months of the year with approximate estimates. A rough calculation has, however, been made of the aggregate exports of the group of major exporting countries, taking into account missing data, in order than some idea of world wheat trade may be supplied.

In spite of their incompleteness, these statistics show that an exceptional increase in wheat exports took place in December, due in particular to the very heavy exports of Canada. The latter amounted during December alone to 34 million bushels, whereas from August to November they averaged barely 11 mil-

lion bushels per month. Argentina and the Danubian countries also exported considerable quantities, at a higher level than in the preceding months. The United States on the other hand reduced their exports, which in any case have only been on a small scale since the beginning of the season. The total exports in December of the group of major exporting countries may be estimated at over 70 million bushels, assuming that Australia exported moderate quantities only. This is an extremely high monthly total, well above those of the last few years, particularly taking into account the fact that it is incomplete and does not include the figures of the minor exporting countries. It is necessary to go back as far as 1931-32 to find a similar total.

*World Net Exports of Wheat, including flour in terms of wheat *,
in the first five months (August-December) of the year.*

	Five months (August-December)		
	1939	1938	1937
	(million bushels)		
Canada (1)	78	82	49
United States (1)	22	33	36
Argentina	79	22	18
Australia (1)	13	30	30
Danubian countries	51	39	34
Total	(1) 256	206	167
Other exporting countries (1) . . . . .	...	(5) 43	(2) 49
Grand total . . . . .	...	249	216

* Aggregate net exports of the normal exporting countries (possible net imports into certain of these countries are not deducted from the totals).

(1) Net exports adjusted in accordance with the monthly variations in stocks of Canadian wheat in the United States and stocks of United States wheat in Canada. — (2) August to October only. — (3) Approximate total including a rough estimate of Australian exports in November and in December. — (4) U. S. S. R., Poland, Lithuania, Algeria, French Morocco, Tunisia, India, Iraq, Iran, Turkey, Chile, Uruguay. — (5) Including 33 million bushels in 1938 and 31 million in 1937 from the U. S. S. R.

Following the heavy exports of December, the total from August 1 to December 31 from the major exporting countries amounts to 256 million bushels, and alone, without including the exports of the minor exporting countries, exceeds the total from all exporting countries during the corresponding period of last year. The increase in world exports compared with 1938-39 is due in particular to the heavy flow of Argentine wheat and to a less extent of Danubian wheat, which together have more than offset the decreases in exports from North America, Australia and the minor exporting countries.

In regard to standing crops, information available at this time of the year is normally rather vague and incomplete, growth of crops being interrupted by the winter cold. In Europe, following a rather mild and generally wet autumn,

the winter season began with severe frosts, accompanied by widespread and heavy falls of snow. The temperature remained very low during the greater part of January, but became milder towards the end of the month and in the first week of February, causing a premature melting of the snow in many districts. Later there was a sudden return of intensely cold weather and snow again fell in almost all parts. The alternation of frosts and thaws has not been favourable for crops, particularly in cases where the return of the cold weather preceded the fall of snow and found fields without adequate protection against the cold. There is not yet any precise information on the damage done by this exceptionally severe winter, but it seems probable that it will be larger than normal this year. The Hungarian Government cabled the Institute on February 16 that the frosts and snow have done serious harm to the winter crops. The various countries of Europe will find it necessary to undertake intensive spring sowing, since mid-season seedlings have almost everywhere been hindered by the unfavourable weather, in order that they may both complement their programmes of winter sowings suspended owing to excessive rain, and fill in the gaps and losses caused by the recent frosts.

In the United States weather conditions between the middle of January and the middle of February were variable, while in some areas alternate frosts and thaws caused complaints of damage, in others there was an improvement in crop condition. Prospects remain generally poor in the western States, where precipitation in the form of snow or rain has been inadequate and where preoccupation caused by the prolonged drought experienced during the autumn, though somewhat relieved, still persists. Crop condition, in any case, is dependent on the weather, conditions of the end of the winter and on the rainfall of the spring, which if favourable might cause a very considerable improvement in present prospects.

In India good rains, which were greatly needed following a prolonged drought, fell since the second half of January, providing sufficient moisture for the favourable development of crops. Forecasts, which were rather pessimistic a month ago, have now improved considerably, particularly as, contrary to the general expectation, the first estimate of the sown acreage of wheat shows a slight increase on last year.

Information on weather conditions in North Africa in recent months suggests that the condition of crops is on the whole satisfactory.

G. CAPONE.

CURRENT INFORMATION FROM VARIOUS COUNTRIES ON WHEAT, RYE, BARLEY AND OATS.¹

Estonia: The temperature in January reached the lowest level recorded for many decades falling as low as -10° . The snow cover was relatively thick.

France: In the second half of January the weather was generally unfavourable and very cold, and a thaw was awaited in order to resume wheat sowing. The ground was frozen to a considerable depth and covered with a crust of ice. Towards the end of the month there was a sudden rise in temperature followed by a complete thaw.

In the first week of February the thaw became general and was followed by heavy or moderately heavy rains. The general condition of the land was rather precarious, for in almost all parts there was an excess of water which was unable to penetrate the frozen soil and valley basins were practically flooded. In the second week of February another wave of cold again froze the ground, stopping work in the fields. It is difficult to estimate the losses attributable to the frosts, but it is feared that a large proportion of standing wheat will have to be resown, though not to such an extent as last year. In addition, there still remains a large wheat acreage to be sown, and intensive efforts will be made to ensure the sowing of spring wheat in good time in March.

Estimates of area sown to wheat vary considerably. For France as a whole it is calculated that the wheat acreage is considerably smaller than normal; in addition part of the area has been lost or seriously compromised by the unfavourable weather. The areas most affected are the north, the Paris region and the east. South of the Loire, however, wheat sowings are normal.

Area sown to Winter Cereals, in thousand acres.

(The years indicated are those of the harvest)

COUNTRIES	WHEAT			RYE			BARLEY			OATS		
	1940	% 1940		1940	% 1940		1940	% 1940		1940	% 1940	
		1939 = 100	1934 to 1938 = 100		1939 = 100	1934 to 1938 = 100		1939 = 100	1934 to 1938 = 100		1939 = 100	1934 to 1938 = 100
Lithuania . . .	346	94.9	90.7	1,248	102.2	100.1	—	—	—	—	—	—
Canada . . .	813	117.5	114.1	766	128.3	119.8	—	—	—	—	—	—
United States .	45,014	97.1	88.1	5,640	78.5	86.8	—	—	—	—	—	—
India . . .	32,381	100.4	98.6	—	—	—	—	—	—	—	—	—

(1) Rye for all purposes, including an allowance for spring-sown rye

At the middle of February it was considered that the latest sharp frosts had not done as much damage as last year, having been preceded by falls of snow, and that crops will have resisted the severe conditions, since growth is advanced. (*Journal du Commerce*, Paris)

Greece Following rather wet weather and south winds, which predominated in November in almost all parts of the country, a wave of cold accompanied by snow and strong north winds occurred towards the end of December and in the first half of January throughout the country and in particular in the north. Snow fell almost continuously during this period and covered Epiros, Macedonia, Thessaly and Thrace. In some districts the snow cover was over a metre thick and the temperature fell to — 4°F. The second half of January became gradually milder and at the beginning of February warm southern winds brought a general thaw.

Hungary During the greater part of the period from January 10 to February 6 exceptionally cold weather predominated. January this year was the coldest month

Area and Production of Wheat.

COUNTRIES	† AREA					† PRODUCTION							
	1939 and 1939-40	1938 and 1938-39	Aver. 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40		1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40	
				1938 and 1938-39	Aver. 1933 to 1937 and 1933-34 to 1937-38							1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38
ooo acres					ooo centals			ooo bushels of 60 lb					
*Albania . . .	...	95	98	...	...	...	990	998	...	1,550	1,663	...	...
Germany () . . .	6,001	5,928	(*) 6,191	101.2	96.9	123,756	139,553	(*) 119,270	206,257	232,584	(*) 198,780	88.7	103.8
*Belgium . . .	354	430	399	82.4	88.6	...	12,079	9,556	...	20,131	15,926	...	...
*Bohemia-Moravia (Protect.) . . .	918	923	...	99.5	...	...	...	...	...	...	...	...	...
Bulgaria . . .	3,037	3,448	3,026	88.1	100.4	42,694	47,371	32,188	71,155	78,950	53,646	90.1	132.6
Denmark . . .	324	325	294	99.7	110.3	9,039	10,161	7,662	15,065	16,935	12,770	89.0	118.0
Spain . . .	8,795	...	() 11,145	...	78.9	67,065	42,417	(*) 90,683	111,773	70,694	(*) 151,136	158.1	74.0
Estonia . . .	185	172	160	107.7	115.8	1,880	1,883	1,565	3,133	3,139	2,609	99.8	120.1
Finland . . .	334	323	175	103.5	190.3	5,005	5,642	2,748	8,341	9,403	4,579	88.7	182.1
France . . .	() 11,683	12,479	13,118	93.6	89.1	...	223,723	179,792	...	372,864	299,648	...	...
Greece . . .	2,356	2,129	1,989	110.7	118.4	22,975	21,681	15,700	38,291	36,135	26,166	100.0	146.3
Hungary . . .	(*) 4,669	4,000	3,910	...	...	(*) 67,660	59,267	48,643	(*) 112,765	98,777	81,070	...	...
*Ireland . . .	...	230	157	...	...	...	4,439	3,276	...	7,398	5,400	...	...
Italy . . .	12,841	12,426	12,541	103.3	102.4	176,370	178,394	160,229	293,945	297,317	267,043	98.1	110.1
Latvia . . .	378	348	333	108.6	113.7	4,380	4,231	3,944	7,300	6,752	6,574	103.5	110.0
Lithuania . . .	500	494	513	101.2	97.4	5,657	5,540	5,596	9,429	9,233	8,993	102.1	104.8
Luxemburg . . .	42	57	41	74.0	101.6	594	1,098	659	1,850	1,093	54.1	90.6	...
Malta . . .	10	10	9	97.3	100.1	167	177	163	279	296	179	94.4	102.9
Norway . . .	...	86	57	...	...	1,531	1,582	1,010	2,551	2,637	1,684	96.7	151.5
Netherlands . . .	306	311	355	98.3	86.2	7,981	9,563	9,368	13,301	15,538	15,613	83.5	85.2
Poland . . .	...	4,335	4,279	...	...	50,045	47,882	45,521	83,407	79,802	75,867	104.5	109.9
*Portugal . . .	...	1,134	1,304	...	...	...	9,481	10,221	...	15,802	17,035	...	...
Romania . . .	10,040	9,435	8,213	106.4	122.2	98,955	106,295	67,074	164,921	177,154	111,787	93.1	147.5
Un Kingdom: Engl and W. Scotland . . .	1,683	1,830	1,726	91.9	97.5	34,832	41,552	34,563	58,053	69,253	57,605	83.8	100.8
*N. Ireland . . .	81	92	94	87.6	86.0	2,016	2,330	2,379	3,360	3,883	3,965	86.5	84.7
*Slovakia . . .	...	6	7	53.0	41.7	...	128	167	...	213	278	...	...
Sweden . . .	828	759	714	109.0	116.0	7,068	...	...	11,780	...	...	...	...
Switzerland . . .	200	195	164	102.7	122.3	3,816	4,687	3,291	6,360	7,812	5,484	81.4	116.0
Yugoslavia . . .	5,542	5,328	5,378	104.0	103.0	62,693	66,799	51,801	104,487	111,329	86,334	93.9	121.0
Total Eur (\$)	53,778	52,525	50,607	102.4	106.3	740,877	780,854	633,696	1,234,774	1,301,401	1,056,141	94.9	116.9
*U.S.S.R. . . .	...	102,550	91,846	...	...	...	897,000	723,604	...	1,494,000	1,205,982	...	...
Canada . . .	735	742	554	99.0	132.8	13,363	11,888	7,743	22,271	19,814	12,905	139.9	197.6
United States (s) . . .	26,021	25,188	24,500	103.3	106.2	280,411	198,118	140,950	467,352	330,196	234,916	81.9	113.3
States (s) . . .	37,802	49,786	36,595	75.9	103.3	338,059	412,880	298,260	563,431	688,133	497,100	78.6	132.8
Mexico . . .	15,894	20,083	14,875	79.1	106.9	114,924	146,141	86,564	191,540	243,569	144,273	81.9	113.3
Total N. Am. . .	1,240	1,224	1,201	101.2	103.2	7,163	7,107	6,954	11,939	11,845	11,590	100.8	103.0
...	81,692	97,023	77,725	84.2	105.1	753,920	776,134	540,471	1,256,533	1,293,557	900,784	97.1	139.5
*China . . .	...	...	48,643	...	...	...	...	464,920	...	...	774,851	...	...
Cyprus . . .	...	191	180	...	...	1,302	1,210	1,246	2,170	2,017	2,077	107.6	104.5
Chosen . . .	860	846	808	101.7	106.4	7,540	6,241	5,566	12,567	10,401	9,277	120.8	135.5
India . . .	35,289	35,640	33,982	99.0	103.8	222,365	241,114	213,718	370,608	401,856	356,197	92.2	104.0
Iraq . . .	...	1,800	1,855	...	...	...	13,228	9,381	...	22,046	15,634	...	...
Japan . . .	1,823	1,777	1,637	102.6	111.4	36,652	27,147	27,883	61,086	45,244	46,471	135.0	131.4
Manchukuo . . .	...	2,805	2,712	...	...	21,197	19,576	19,253	35,327	32,626	32,088	108.3	110.1
Palestine . . .	500	441	515	113.4	97.0	3,000	980	1,929	5,000	1,633	3,215	306.2	155.5
Syria & Leb. . .	(*) 1,429	1,404	1,313	101.7	108.8	(*) 13,382	14,205	9,745	(*) 22,303	23,674	16,241	94.2	137.3
*Transjordan . . .	...	...	...	...	...	...	1,876	1,600	...	3,127	2,666	...	...
Turkey . . .	...	9,497	7,980	...	...	101,587	93,660	67,809	169,309	156,097	113,013	108.5	149.8
Total Asia (\$)	52,394	52,601	49,127	99.6	106.6	407,025	404,133	347,149	678,370	673,548	578,579	100.7	117.2
Algeria . . .	4,084	4,101	4,151	99.6	98.4	25,574	20,965	20,645	42,622	34,941	34,408	122.0	123.9
Egypt . . .	1,501	1,470	1,443	102.1	104.0	29,406	27,561	25,384	49,009	45,935	42,305	106.7	115.8
Kenya (*) . . .	...	63	51	...	...	...	550	355	...	916	591	...	...
Libya . . .	...	156	69	...	...	...	551	776	...	919	1,293	398	71.0
F. Morocco . . .	3,188	2,999	3,213	106.3	99.2	23,259	13,903	14,599	38,764	23,172	24,331	167.3	159.3
Tunisia . . .	2,104	1,667	1,876	126.2	112.2	11,133	8,378	7,871	18,555	13,962	13,117	132.9	141.5
Total N. Afr. . .	11,033	10,393	10,752	106.1	102.6	89,923	71,583	68,738	149,869	119,303	114,559	125.6	130.8
Argentina . . .	(*) 17,833	(*) 20,868	(*) 17,881	85.5	99.7	70,813	201,724	132,271	118,019	336,199	220,448	35.1	53.5
*Chile . . .	2,055	2,044	1,990	100.5	103.3	...	21,322	18,738	...	35,536	31,229	...	...
Uruguay . . .	1,198	1,256	1,183	95.4	101.3	5,741	9,277	7,952	9,568	15,461	13,252	61.9	72.2
Un. S. Afr. (*) . . .	2,131	2,081	1,739	102.4	122.5	9,498	10,256	9,227	15,830	17,093	15,378	92.6	102.9
Australia . . .	13,500	14,224	13,091	94.9	103.1	126,240	92,726	95,231	210,400	154,543	158,719	136.1	132.6
*N. Zealand . . .	(s) 259	(s) 193	(s) 239	134.0	108.4	...	3,338	4,445	...	5,564	7,408	...	...
TOTALS (\$). . .	233,559	250,971	222,105	93.1	105.2	2,204,037	2,346,687	1,834,735	3,673,363	3,911,105	3,057,860	93.9	120.1

See notes on page 93.

Area and Production of Rye.

COUNTRIES	† AREA					† PRODUCTION							
	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40		1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40	
				1938 and 1938-39 = 100	Aver. 1938-39 = 100							1938 and 1938-39 = 100	Aver. 1938-39 = 100
ooo acres					ooo centals			ooo bushels of 56 lb.					
*Albania.	...	8	7	...	...	72	79	...	129	141	...	...
Germany (1)	11,941	12,150	(2) 12,671	98.3	94.2	208,443	213,849	(2) 195,771	372,221	381,874	(2) 349,592	97.5	106.5
*Belgium	364	381	409	95.5	88.9	...	8,489	8,760	...	15,158	15,643	...	...
*Bohemia-Moravia (Protect.).	1,204	1,230	—	97.9	—	—	—	—	—	—	—	—	—
Bulgaria	447	464	491	96.3	91.1	5,417	4,142	4,644	9,674	7,397	8,293	130.8	116.7
Denmark	333	359	358	93.0	93.0	5,512	6,252	5,556	9,842	11,165	9,921	88.2	99.2
*Spain	1,290	—	(3) 1,443	—	89.4	9,639	7,650	(3) 11,134	17,212	13,661	(3) 19,882	126.0	86.6
Estonia	372	365	360	101.9	103.3	5,019	4,146	4,365	8,963	7,403	7,795	121.1	115.0
Finland	568	583	591	97.4	96.2	7,297	8,124	8,187	13,031	14,507	14,619	89.8	89.1
*France	(4) 1,601	1,559	1,668	102.6	95.9	...	17,882	17,356	...	31,933	30,993	...	...
Greece	156	178	175	87.7	89.1	1,376	1,366	1,307	2,457	2,439	2,334	100.7	105.2
Hungary	(5) 1,728	1,562	1,581	—	—	(5) 19,773	17,739	16,030	(5) 35,310	31,677	28,625	—	—
*Ireland	...	2	2	...	...	...	30	39	...	53	69	...	...
Italy	260	257	270	101.2	96.3	3,339	3,040	3,301	5,962	5,428	5,895	109.8	101.1
Latvia	737	709	664	104.0	111.1	9,473	8,349	8,105	16,916	14,909	14,474	113.5	116.9
Lithuania	1,229	1,247	1,236	98.5	99.4	14,533	13,751	13,278	25,951	24,555	23,711	105.7	109.4
Luxemburg	19	18	19	108.1	103.1	274	284	271	490	507	483	96.6	101.3
Norway	...	13	15	...	...	228	242	245	408	433	437	94.2	93.3
Netherlands	557	601	501	92.7	111.1	13,228	12,149	10,259	23,621	21,694	18,319	108.9	128.9
Poland	...	14,567	14,227	...	...	168,213	159,911	141,785	300,382	285,556	253,187	105.2	118.6
*Portugal	...	331	365	...	...	...	2,269	2,299	...	4,051	4,105	...	...
Romania	1,105	1,190	991	92.9	111.6	10,461	11,402	8,310	18,681	20,362	14,840	91.7	125.9
Un. Kingdom:													
* Engl. and Wales	...	16	14	...	...	...	240	194	...	428	347	...	...
*Slovakia	—	—	—	—	—	4,428	—	—	7,907	—	—	...	...
Sweden	463	498	551	92.9	83.9	8,340	8,922	9,583	14,894	15,933	17,112	93.5	87.0
Switzerland	39	39	39	101.3	100.7	721	810	717	1,287	1,447	1,280	89.0	100.6
Yugoslavia	650	640	643	101.6	101.0	5,369	5,007	4,627	9,587	8,941	8,262	107.2	116.0
Total Eur. (\$)	35,184	35,638	35,581	98.7	98.9	487,016	481,910	438,766	869,677	860,558	783,510	101.1	111.0
*U. S. S. R.	...	(10) 50,904	59,051	...	...	...	(6) 441,000	(11) 482,679	...	(6) 787,000	(11) 186,930	...	...
—													
Canada	1,102	741	701	148.6	157.1	8,572	6,153	3,197	15,307	10,988	5,708	139.3	268.2
United States	3,811	4,021	3,043	94.8	125.2	21,979	31,116	19,290	39,249	55,564	34,447	70.6	113.9
Total N. Am.	4,913	4,762	3,744	103.2	131.2	30,551	37,269	22,487	54,556	66,552	40,155	82.0	135.9
Turkey	...	1,130	809	...	...	9,396	9,887	6,659	16,779	17,656	11,890	95.0	141.1
—													
Algeria	5	5	3	116.8	172.7	25	25	18	44	44	31	99.7	140.2
—													
Argentina	(9) 2,296	(9) 2,254	(9) 2,008	101.9	114.3	8,510	6,063	4,471	15,196	10,826	7,984	140.4	190.3
—													
*U. of S. Afr. (8)	...	...	(11) 115	...	...	...	...	450	...	...	804	...	...
TOTALS . (\$)	43,528	43,789	42,145	99.4	103.3	535,498	535,154	472,401	956,252	955,636	843,570	100.1	113.4

Area and Production of Meslin.

COUNTRIES	† AREA					† PRODUCTION							
	1939	1938	Average 1933 to 1937	% 1939		1939	1938	Average 1933 to 1937	1939	1938	Average 1933 to 1937	°, 1939	
				1938	Aver.							1938	Aver.
= 100	= 100	= 100	= 100										
ooo acres					ooo centals			ooo bushels of 56 lb					
Germany (1) .	1,658	1,500 (2)	1,175	110.5	141.2	29,296	29,101 (2)	19,180	50,511	50,175 (2)	33,070	100.7	152.7
Belgium . . .	4	4	8	87.4	48.5	...	90	96	...	156	166	...	...
Bohem. & Mo- ravia (Prot.)	9	9	—	101.1	—	—	—	—	—	—	—	—	—
Bulgaria . . .	198	258	249	76.8	79.5	2,596	2,902	2,726	4,476	5,004	4,700	89.5	95.2
Denmark . . .	736	746	810	98.6	90.8	15,432	17,533	16,960	26,608	30,230	29,241	88.0	91.0
Spain . . . . .	...	...	(11) 111	...	...	...	...	(11) 625	...	...	(11) 1,077	...	...
Estonia	312	209	195	149.3	160.1	3,310	2,460	1,894	5,707	4,242	3,266	134.5	174.7
Finland	24	24	35	103.2	70.8	353	392	535	608	675	923	90.0	65.9
France	(4) 188	188	182	100.2	103.5	...	2,482	2,075	...	4,280	3,578	...	...
Greece	153	156	136	98.3	112.9	1,191	1,122	840	2,053	1,934	1,449	106.2	141.7
Latvia	223	195	181	114.6	123.6	...	2,657	2,188	...	4,581	3,773	...	...
Lithuania . . .	267	277	260	96.3	102.9	3,058	3,279	2,788	5,272	5,654	4,807	93.2	109.7
Luxemburg . . .	3	4	6	65.8	42.6	39	68	92	67	117	159	57.6	42.2
Norway . . . . .	...	11	12	...	...	209	236	218	361	406	375	88.8	96.2
Poland . . . . .	...	326 (11)	337	...	...	...	3,924 (11)	3,551	...	6,766 (11)	6,122	...	...
Un Kingdom:													
Engl and W.	83	92	97	89.7	85.7	1,613	1,658	1,716	2,781	2,858	2,958	97.3	94.0
Sweden	628	629	611	99.8	102.8	13,144	14,631	11,729	22,663	25,226	20,223	89.8	112.1
Switzerland . .	18	18	17	100.0	109.6	346	423	349	597	730	602	81.8	99.2
Yugoslavia . . .	...	169	154	...	...	...	1,334	1,186	...	2,300	2,044	...	...
Canada	1,218	1,159	1,156	105.1	105.4	19,832	17,622	16,221	34,194	30,383	27,968	112.5	122.3
Turkey . . . . .	...	332	216	...	...	3,256	2,986	1,682	5,614	5,149	2,901	109.0	193.6

NOTES FOR TABLES OF WHEAT, RYE AND MESLIN

† The years indicated are those of the harvest, single years referring to the Northern Hemisphere, double years to the Southern. — * Countries not included in the totals. — (8) In calculating the totals account has been taken of the probable area cultivated in some countries for which estimates of production are available but not those of area. As the estimates for Hungary for 1939 include the areas and production of territories recently annexed by this country, the totals for Europe and the general totals for 1938 and for the average have been adjusted approximately to maintain the comparability of the series — (4) Winter crop. — (5) Spring crop — (1) Including Austria, Sudetenland and Memelland. — (2) Average 1932 to 1937 — (3) Average of four years. — (4) Estimated on May 1 — (5) Present frontiers excluding Sub Carpathian Russia — (6) Approximate calculated figure — (7) Not including Alexandretta — (8) Cultivation by Europeans only. — (9) Area sown. — (10) Area provided for in the Plan. — (11) Average of three years.

of the last decade and, except for February 1929, the coldest of the last forty years. Precipitation, mainly in the form of snow, was above average throughout the country, in some districts it was double the average. The beginning of the period of intense cold on December 28, 1939 found winter cereals without a protective snow cover. In the first days of January only small quantities of snow fell and the whole country was only covered by January 17. From this date until the first week of February, the young plants were protected by snow. It is estimated that damage has been done by the cold spell before the fall of snow and by the heavy mass of snow itself. The principal danger to crops, however, is believed to lie in the fact that the ground, being frozen to a depth of 2 to 3 feet, will not be able to absorb large quantities of water.

Ireland. The first half of December was unsettled with occasional heavy rains and some local flooding. The weather of the second half of the month was finer,

but with rather severe frost in some districts. Farm operations were mostly well up to date at the end of the month.

Lithuania: The weather in January was comparatively settled with a very low temperature. Fields were covered with deep snow. Such conditions were favourable for winter cereals.

Romania: At the beginning of February, winter cereal plants in almost all parts of the country were covered by deep snow. The damage done to crops by the frosts has not yet been estimated, but it seems to be only about average.

The Ministry of Agriculture is making every effort to be in a position to distribute seeds of cereals and other spring crops, in order that the entire arable land of the country may be brought into cultivation. Although no relative statistics have been published, it seems certain that the area under winter wheat, owing mainly to wet weather, is lower than that of recent years.

United Kingdom. A prolonged wave of Arctic weather with deep snow, particularly in the north, retarded field operations during January. Warmer weather eventually brought a thaw in the first week of February.

A new Agricultural Bill was introduced in Parliament to supply credits to farmers at the usual rates of interest through the War Agricultural Executive Committees. The bill is designed especially to assist small farmers unable to obtain credits from the banks, in order to assist them in extending production.

Yugoslavia: The severely cold weather of the end of December continued during the first three weeks of January, turning, however, slightly milder towards the end of this period. The cold returned during the following three days but the weather became gradually milder and a complete thaw set in in the first decade of February. Heavy snow, which fell almost every day in January in the north and in the centre of the country, fully protected winter cereals against the rigours of the winter. On the Adriatic littoral and in the south, January was frequently fine and less cold than in the rest of the country and rain fell at the beginning of February.

The condition of winter cereals at the beginning of February, in spite of the cold weather, was considered on the whole satisfactory, owing to the protection of the heavy snow cover. It is confirmed that the area of winter cereals, particularly of winter wheat, has been reduced as a result of the unfavourable autumn and winter weather. It is forecast that this reduction in the area will be offset by an extension of the area of spring cereals and more particularly, of maize.

Argentine: The second estimate of wheat production in 1939-40 shows a decrease of about 17,000,000 centals (29,000,000 bushels) on the first estimate published at the middle of December. Accordingly, this year's crop is the smallest since the Great War. The new estimate is 64.9 per cent. lower than the final estimate of the 1938-39 crop (201,700,000 centals or 336,200,000 bushels) and 46.5 per cent. less than the preceding five-year average (132,300,000 centals or 220,400,000 bushels).

The poor crop of this year was obtained from a sown area that was 14.5 per cent. smaller than the large area of last year and about equal to the five-year average. The unprecedented drop in wheat production is almost entirely due to the unfavourable conditions of the year, namely, excessive rain in October and November, insect infestation and repeated frosts in the final stage of growth.

Area and Production of Barley.

COUNTRIES	† AREA					† PRODUCTION							
	1939 and 1939- 1940	1938 and 1938- 1939	Average 1933 to 1933- 1934 to 1937- 1938	% 1939 and 1939-40		1939 and 1938- 1939 to 1937- 1938 = 100	1939 and 1938- 1939 to 1937- 1938 = 100	1939 and 1938- 1939 to 1937- 1938 = 100	1939 and 1938- 1939 to 1937- 1938 = 100	1939 and 1938- 1939 to 1937- 1938 = 100	1939 and 1938- 1939 to 1937- 1938 = 100	1939 and 1938- 1939 to 1937- 1938 = 100	1939 and 1938- 1939 to 1937- 1938 = 100
	ooo acres	ooo acres	ooo acres	ooo acres	ooo acres	ooo cents	ooo cents	ooo bushels of 48 lb.	ooo bushels of 48 lb.	ooo bushels of 48 lb.	ooo bushels of 48 lb.	ooo bushels of 48 lb.	ooo bushels of 48 lb.
*Albania . . .	13	13	13	99.7	102.3	92	131	192	274	180.048	88.8	108.7	108.7
*Germany (1) . . .	4,826	4,838	4,717	99.7	102.3	93,956	105,822	86,421	195,746	220,467	180.048	88.8	108.7
*Belgium . . .	48	76	85	62.9	56.9	1,967	2,046	4,098	4,098	4,263	...	...	...
*Bohemia													
Moravia													
(Protect.) . . .	644	638	—	101.0	—	—	—	—	—	—	—	—	—
Bulgaria . . .	563	555	549	101.5	102.6	7,359	7,821	6,495	15,332	16,294	13,532	94.1	113.3
Denmark . . .	1,021	982	876	104.0	116.6	27,337	29,970	22,132	56,954	62,438	46,109	91.2	123.5
*Spain . . .	3,321	—	4,615	—	72.0	30,863	16,270	48,607	64,298	33,897	101,266	189.7	63.5
Estonia . . .	207	217	248	95.6	83.4	1,985	2,133	2,009	4,136	4,443	4,186	93.1	98.8
*Finland . . .	306	298	316	102.6	96.8	4,233	4,572	4,031	8,819	9,524	8,399	92.6	105.0
*France . . .	1,975	1,876	1,806	105.3	109.4	—	28,457	23,030	—	59,286	47,979	—	—
Greece . . .	532	541	525	98.3	101.4	4,877	5,412	4,373	10,160	11,276	9,111	90.1	111.5
Hungary . . .	1,344	1,121	1,150	—	—	17,207	15,961	13,920	35,849	33,253	29,002	—	—
*Ireland . . .	—	118	132	—	—	—	2,468	2,961	—	5,142	6,168	—	—
Italy . . .	497	492	492	101.0	101.1	5,409	5,465	4,668	11,270	11,386	9,726	99.0	115.9
Latvia . . .	445	440	459	101.3	97.0	4,608	4,863	4,413	9,601	10,131	9,193	94.8	104.4
Lithuania . . .	516	519	516	99.3	99.9	5,656	6,041	5,486	11,784	12,586	11,430	93.6	103.1
Luxembourg . . .	5	5	6	106.9	84.9	75	67	78	156	140	162	111.6	96.1
Malta (2) . . .	5	5	5	97.6	97.8	98	102	99	205	210	207	96.1	99.0
Norway . . .	—	148	148	—	—	2,793	2,741	2,571	5,819	5,711	5,355	101.9	108.7
Netherlands . . .	102	107	90	95.0	112.6	3,086	3,097	2,295	6,430	6,452	4,781	99.7	134.5
Poland . . .	—	2,910	2,963	—	—	32,629	30,233	31,401	67,977	62,986	65,420	107.9	103.9
*Portugal . . .	—	186	173	—	—	—	860	872	—	1,791	1,816	—	—
Romania . . .	2,708	3,158	4,123	85.7	65.7	22,168	18,347	27,375	46,183	38,223	57,032	120.8	81.0
Un Kingdom . . .	—	—	—	—	—	—	—	—	—	—	—	—	—
Engl & W. . .	910	885	809	102.8	112.5	17,786	17,987	14,573	37,053	37,473	30,361	98.9	122.0
*Scotland . . .	99	99	77	100.1	128.4	—	2,195	1,649	—	4,573	3,435	—	—
*N. Ireland . . .	3	3	3	101.9	138.5	—	74	56	—	153	117	—	—
Sweden . . .	280	272	256	102.7	109.2	5,517	5,876	4,600	11,494	12,241	9,583	93.9	120.0
Switzerland . . .	12	11	13	107.1	92.3	187	203	169	390	423	351	92.2	111.1
Yugoslavia . . .	1,045	1,049	1,073	99.7	97.5	9,349	9,287	9,059	19,477	19,349	18,872	100.7	103.2
Total Europe . . .	18,382	18,800	19,581	97.7	93.9	266,315	279,527	249,254	554,835	582,358	519,290	95.3	106.9
*U S S R . . .	—	20,599	20,714	—	—	—	163,566	167,899	—	340,769	349,797	—	—
Canada . . .	4,347	4,454	3,985	97.6	109.1	49,511	49,076	35,148	103,147	102,242	73,224	100.9	140.9
United States . . .	12,600	10,513	9,390	119.9	134.2	132,623	121,442	88,706	276,298	253,005	184,805	109.2	149.5
*Mexico . . .	—	357	359	—	—	—	1,536	1,579	—	3,199	3,291	—	—
Total N. Am. . .	16,947	14,967	13,375	113.2	126.7	182,134	170,518	123,854	379,445	355,247	258,029	106.8	147.1
*China . . .	—	—	15,881	—	—	—	—	166,179	—	—	346,212	—	—
Cyprus . . .	—	115	113	—	—	1,035	913	938	2,156	1,902	1,954	113.4	110.4
Chosen . . .	2,762	2,738	2,571	100.9	107.4	27,314	24,528	25,021	56,905	51,100	52,128	111.4	109.2
*Iraq . . .	—	2,533	1,562	—	—	—	25,097	8,807	—	52,286	18,349	—	—
Japan . . .	1,879	1,892	1,894	99.3	99.2	39,200	30,807	34,727	81,669	64,182	72,349	127.2	112.9
*Manchukuo . . .	—	265	482	—	—	—	2,150	4,054	—	4,479	8,447	—	—
*Palestine . . .	509	502	568	101.4	89.7	—	1,471	1,339	—	3,065	2,790	—	—
Syria & Leb . . .	888	838	746	106.0	119.1	8,157	8,453	6,605	16,994	17,611	13,761	96.5	123.5
*Transjordan . . .	—	—	—	—	—	—	992	760	—	2,067	1,583	—	—
Turkey . . .	—	4,851	4,100	—	—	50,601	53,100	40,004	105,420	110,626	83,344	95.3	126.5
Total Asia . . .	10,495	10,434	9,424	100.6	111.4	126,307	117,801	107,295	263,144	245,421	223,536	107.2	117.7
Algeria . . .	3,063	2,909	3,180	105.3	96.3	24,251	12,944	16,389	50,524	26,967	34,143	187.4	148.0
Egypt . . .	273	274	284	99.7	96.1	5,251	5,129	4,812	10,941	10,686	10,026	102.4	109.1
*Libya . . .	—	367	325	—	—	—	—	766	—	—	1,596	—	—
F. Morocco . . .	4,720	4,155	4,160	113.6	113.5	46,915	23,937	25,353	97,740	49,869	52,819	196.0	185.0
Tunisia . . .	1,483	756	1,149	196.0	129.0	7,716	2,205	3,946	16,076	4,593	8,222	350.0	195.5
Total Africa . . .	9,539	8,094	8,773	117.9	108.7	84,133	44,215	50,500	175,281	92,115	105,210	190.3	166.6
Argentina . . .	(2,122)	(2,053)	(1,921)	103.3	110.5	—	—	—	—	—	—	—	—
*Chile . . .	—	1,232	1,330	—	—	17,637	9,700	13,761	36,744	20,209	28,608	181.8	128.2
Uruguay . . .	141	203	193	69.7	73.2	—	2,402	2,627	—	5,005	5,473	—	—
(14) . . .	62	52	26	119.8	—	370	306	189	772	638	394	121.0	—
*Un. of S. Afr. . .	—	—	74	—	—	—	—	626	—	—	1,303	—	—
*N. Zealand . . .	31	33	29	96.8	110.0	—	—	—	—	—	790	—	—
(27) . . .	27	27	21	—	—	—	538	379	—	1,122	—	—	—
TOTALS . . .	56,657	53,579	52,509	105.7	107.9	676,896	622,067	544,853	1,410,221	1,295,988	1,135,127	108.8	124.2

See notes at the end of the following table.

Area and Production of Oats.

COUNTRIES	† AREA						† PRODUCTION							
	1939 and 1940	1938 and 1939	Average 1933 to 1937 and 1933- 1934 to 1937- 1938	1939 and 1939-40		Aver. 1938- 1939 = 100	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939 40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40	
			1938 and 1933- 1934 to 1937- 1938	1939 and 1938- 1939 = 100	1938 and 1933-34 to 1937-38				1939 and 1938-39 = 100			1938 and 1938-39 = 100	Aver.	
			1938 and 1933- 1934 to 1937- 1938	1939 and 1938- 1939 = 100	1938 and 1933-34 to 1937-38				1939 and 1938-39 = 100			1938 and 1938-39 = 100	Aver.	
ooo acres						ooo centals			ooo bushels of 32 lb.					
* Albania . . .	...	28	24	...	...	...	...	248	212	...	776	663	...	...
Germany ⁽¹⁾ . .	8,102	7,917 ^(*)	8,356	102.3	97.0	...	151,407	158,954 ^(*)	144,624	473,144	496,727 ^(*)	451,946	95.3	104.7
* Belgium . . .	603	527	571	114.5	105.7	...	...	13,692	15,361	...	42,738	48,002	...	...
* Bohemia Moravia (Protect) . . .	894	904	—	98.9	—	...	...	—	—	...	—	—	...	...
Bulgaria . . .	274	355	316	77.3	86.8	...	2,819	1,964	2,555	8,810	6,137	7,984	143.6	110.3
Denmark . . .	916	926	932	98.9	98.3	...	22,487	25,225	21,548	70,272	78,829	67,337	89.1	104.4
* Spain . . .	1,391	—	1,758	—	79.1	...	10,404	7,033 ^(*)	13,603	32,511	21,977 ^(*)	42,508	147.9	76.5
Estonia . . .	356	368	345	96.8	103.2	...	3,295	3,891	2,925	10,296	12,160	9,139	84.7	112.7
Finland . . .	1,206	1,143	1,141	105.5	105.7	...	17,593	18,423	15,171	54,978	57,572	47,409	95.5	116.0
* France . . .	8,010	8,019	8,160	99.9	98.2	...	...	120,316	101,742	...	375,986	317,942	...	...
Greece . . .	^(*) 373 ^(*)	^(*) 383 ^(*)	^(*) 340	97.4	109.8	...	3,343	3,362	2,477	10,447	10,505	7,741	99.5	135.0
Hungary . . .	^(*) 636 ^(*)	^(*) 554 ^(*)	^(*) 545	—	—	^(*) ...	7,864 ^(*)	6,842 ^(*)	6,152 ^(*)	24,575 ^(*)	21,382 ^(*)	19,225	—	—
* Ireland . . .	570	570	593	...	...	...	...	12,523	12,952	...	39,133	40,474	...	...
Italy . . .	1,044	1,093	1,073	95.5	97.3	...	12,938	13,869	11,820	40,430	43,342	36,938	93.3	109.5
Latvia . . .	935	860	798	108.8	117.2	...	9,927	9,846	7,913	31,023	30,769	24,727	100.8	125.5
Lithuania . .	859	838	854	102.5	100.6	...	9,016	9,259	8,108	28,176	28,936	25,338	97.4	111.2
Luxemburg . .	62	61	66	100.8	93.9	...	992	916	963	3,100	2,864	3,011	108.3	103.0
Norway . . .	...	211	221	...	...	...	4,038	4,337	3,960	12,620	13,554	12,375	93.1	102.0
Netherlands .	403	369	334	109.0	120.5	...	9,921	9,845	6,906	31,002	30,765	21,580	100.8	143.7
Poland . . .	5,734	5,627	5,535	101.9	103.6	...	63,493	58,565	56,503	198,415	183,015	176,570	108.4	112.4
* Portugal . .	...	618	527	...	...	...	...	2,090	1,954	...	6,530	6,106	...	...
Romania . . .	1,427	1,609	1,998	88.7	71.4	...	10,492	10,209	14,653	32,787	31,904	45,792	102.8	71.6
United King- dom: Engl and Wales . . .	1,358	1,301	1,392	104.4	97.6	...	25,066	23,946	24,631	78,330	74,830	76,972	104.7	101.8
* Scotland . .	774	798	829	97.0	93.3	...	...	14,179	14,909	...	44,310	46,592	...	...
* N. Ireland . .	291	297	272	98.2	106.9	...	...	6,489	5,819	...	20,279	18,185	...	...
Sweden . . .	1,647	1,647	1,639	100.0	100.5	...	28,328	30,441	26,610	88,526	95,127	83,154	93.1	106.5
Switzerland . .	30	28	29	105.6	101.2	...	564	560	464	1,764	1,750	1,451	100.8	121.5
Yugoslavia . .	^(*) 910 ^(*)	^(*) 917 ^(*)	^(*) 925	99.2	98.4	...	7,645	7,199	7,103	23,891	22,496	22,195	106.2	107.6
Total Europe §	26,483	26,306	26,938	100.7	98.3	...	391,228	398,755	366,188	1,222,586	1,246,109	1,144,329	98.1	106.8
* U. S. S. R. . .	...	41,196	43,544	...	...	...	...	^(*) 349,163 ^(*)	386,399	...	^(*) 1,091,128 ^(*)	1,207,488	...	...
Canada . . .	12,790	13,010	13,538	98.3	94.5	...	130,698	126,270	106,295	408,432	394,593	332,173	103.5	123.0
United States .	33,070	35,661	34,889	92.7	94.8	...	299,909	341,898	282,719	937,215	1,068,431	883,498	87.7	106.1
Total N. Am. .	45,860	48,671	48,427	94.2	94.7	...	430,607	468,168	389,014	1,345,647	1,463,024	1,215,671	92.0	110.7
* China . . .	...	2,522	...	...	...	...	...	...	19,108	...	...	59,712	...	...
* Cyprus . . .	...	14	12	...	...	...	...	89	71	...	277	222	...	...
* Japan . . .	...	337	303	...	...	...	...	4,523	3,682	...	14,135	11,505	...	...
* Manchukuo . .	...	242 ⁽¹⁾	86	...	...	...	...	1,193 ⁽¹⁾	775	...	3,727 ⁽¹⁾	2,421	...	...
* Palestine . .	...	2	2	...	...	...	...	9 ⁽¹⁾	15	...	28	48	...	...
Syria & Leb Turkey . . .	12	24	29	47.7	39.4	...	120	218	267	375	682	836	55.0	44.9
Algeria . . .	...	596	531	...	...	...	6,512	5,680	4,574	20,351	17,748	14,294	114.7	142.4
Fr. Morocco . .	516	451	457	114.5	113.0	...	4,850	3,486	3,234	15,157	10,892	10,107	139.2	150.0
Tunisia . . .	131	120	80	109.3	163.5	...	1,676	1,048	569	5,236	3,275	1,777	159.9	294.6
Uruguay . . .	99	99	71	99.8	140.2	...	661	661	381	2,067	2,067	1,192	100.0	173.4
Total N. Afr. .	746	670	608	111.9	122.8	...	7,187	5,195	4,184	22,460	16,234	13,076	138.4	171.8
Argentina { . .	^(*) (3,446)	^(*) (3,361)	^(*) (3,292)	102.5	104.7	...	...	...	...	...	...	...	...	...
Chile { . . .	⁽¹⁾ 1,766 ⁽¹⁾	⁽¹⁾ 1,764	...	...	...	...	20,371	16,094	16,470	63,658	50,293	51,468	126.6	123.7
Uruguay . . .	257	337	249	76.2	103.2	...	...	3,366	2,213	...	10,519	6,915	...	...
Un. of S. Afr. ¹⁴	219	246	202	89.6	108.6	...	983	1,149	934	3,073	3,589	2,917	85.6	105.3
Un. of S. Afr. ¹⁴	...	...	503	...	...	...	...	...	2,165	...	...	6,765	...	...
* N. Zealand . .	^(*) 254 ^(*)	280 ^(*)	334	90.8	76.1	...	...	...	1,168	...	3,256	3,650	...	...
TOTALS §	75,683	78,279	78,499	96.7	96.4	...	857,008	895,259	781,631	2,678,150	2,797,679	2,442,591	95.7	109.6

† The years indicated are those of the harvest, single years referring to the Northern Hemisphere, double years to the Southern. — * Not included in the totals. — § In calculating totals account has been taken of the probable area cultivated in some countries for which estimates of production are available but not those of area. As the estimates for Hungary for 1939 include the areas and production of territories recently annexed by this country, the totals for Europe and the general totals for 1938 and for the average have been adjusted approximately to maintain the comparability of the series. — (1) Including Austria, Sudetenland and Memel. — (2) Average 1933-37. — (3) Average 1933-36. — (4) Area sown. — (5) Including the northern territory annexed by Hungary but excluding the Sub-Carpathian territory. — (6) Frontiers as at the end of 1937. — (7) Barley and meslin. — (8) Area provided for by the Plan. — (9) Approximate estimate. — (10) Average 1933-35. — (11) Year 1936. — (12) Area harvested. — (13) Malting barley. — (14) European crops only.

United States: At the middle of January, the winter wheat crop in the main section of the belt was reported to be protected by a good snow cover. In Kansas there was a uniform cover but more falls were needed in Oklahoma. The condition in Texas was fairly good while in the Pacific Northwest the crop was doing well.

In the week preceding January 19, the snow cover in the southern and eastern portions of the Ohio Valley States disappeared owing to rain and warmer weather but the snow cover remained ample in Missouri and Iowa. Kansas received good snow but there was drifting and evaporation in the west. Condition in Oklahoma was poor with dry subsoil. Progress in Texas was fair to good.

In the following week there was ample snow cover in the main winter wheat belt, with the exception of Oklahoma where there were duststorms. There was probably some damage from cold weather in the extreme south of the southern Great Plains.

At the end of January there was a good snow cover but some fields in the southwestern belt were becoming bare. In Nebraska the slow melting of the snow allowed the ground to absorb the moisture well. In some of the southern sections of Kansas the ground was bare of snow. Severe weather did serious damage in Mississippi and Louisiana.

Uruguay: The final estimate of wheat production in 1939-40 shows a reduction of about 880,000 centals (1,500,000 bushels) on the former estimate, confirming that the crop is very poor, being 38.1 per cent. lower than last season and 27.8 per cent. less than the previous five-year average. The grain is of poor quality.

India. In the week ending January 21 rainfall was nearly general in Punjab and Rajputana on one day and fairly widespread in Baluchistan, the North West Frontier Provinces, extending to central India, and the east of the United Provinces. There were only local falls elsewhere. The following week was dry, except for widespread showers in eastern Rajputana on one day. In the week ending February 4 widespread rain fell in Sind, the United Provinces, Punjab and Bihar on one day.

In the Punjab, the most important wheat producing province, badly-needed rain fell in all districts in the week ending January 22 with a maximum of 2.58 inches in Sialkot and a minimum of 0.06 inch in Dera Ghazi Khan. There was further light rain in the last week of January. Early in January damage from white ants was reported in Multan. Crop condition on January 20 was average to good in the irrigated areas and under average to average in the unirrigated.

In the Central Provinces, which follow the Punjab and the United Provinces as wheat producers, slight damage was done in Saneor and Jabulpore by frost in the week ending January 13. Cool breezes had an adverse affect in Nagpur. There were light showers in the week ending January 20. In the following week the weather remained cool and cloudy.

In Orissa wheat was thriving at the end of the month.

According to the first report, the area under wheat in the Punjab in 1939-40 is estimated at 9,842,000 acres against the corresponding estimate of 9,460,000 acres in 1938-39 and an average of 10,199,000 acres in 1933-34 to 1937-38; percentages, 104.0 and 96.5.

Algeria: Prospects for the next wheat harvest are very favourable.

Egypt: The growth of wheat and barley was rather slow in January owing to the low temperature, but was assisted by rain in several districts where irrigation canals

are still dry owing to winter closing. Ear formation had begun among early crops in some districts at the end of the month. The manuring of fields which had not been manured earlier was completed, and crops were irrigated on land possessing supplies of artesian well water. Crop condition at the end of the month was on the whole normal.

Union of South Africa: In the southwestern cereal belt of Cape Province December was hot and very favourable for threshing. Not only the wheat crop but also the barley and oats crops are poor in this area. On the south coast threshing yields confirmed that the crop is satisfactory.

In Transvaal heavy rains in December damaged wheat crops still unharvested, while threshed wheat was too moist for delivery to co-operative societies.

In the Orange Free State wheat yields were on the whole satisfactory.

Australia The weather during January was favourable for preparations for the next wheat crop

CURRENT INFORMATION ON MAIZE.

Yugoslavia: Owing to the reduction in the area sown to winter cereals, it is forecast that the acreage to be seeded to maize this year will be larger.

Argentina: Heavy well distributed rains in the principal maize areas during the first stages of growth and in the first half of January were favourable for the germination and growth of crops. The situation throughout the country in January promised a good crop for the 1939-40 season.

Uruguay: There were favourable rains in January and in the first half of February. A good crop is expected.

Netherlands Indies: Java and Madura. — The Department of Agricultural Statistics of the Central Statistical Office communicates the following details on the maize area.—

	1939 acres	1938 acres
Area harvested in December	487,100	437,900
Area harvested from January 1 to December 31.	5,015,600	4,957,300
Area of standing crops at the end of December.	2,370,300	2,505,200

Union of South Africa: Good rains fell in December in Transvaal, Natal and the northeast of Orange Free State. In the remainder of Orange Free State drought conditions prevailed, and though maize crops were not yet damaged, rain was urgently needed. Cutworms and caterpillars were particularly prevalent in all three provinces, and in parts of the Orange Free State farmers had even been compelled to replant damaged crops as often as three times. Locust swarms were prevalent in Transvaal and Orange Free State and did same damage. Crops were also damaged in parts of Transvaal by excessive rain and hail, but on the western highveld prospects were promising.

Area and Production of Maize.

COUNTRIES	† AREA				† PRODUCTION							
	1939 and 1939- 1940	1938 and 1938- 1939	Aver. 1933 to 1937 and 1933- 1934 to 1937- 1938	% 1939 and 1939-40	1939 and 1939- 1940	1938 and 1938- 1939	Average 1933 to 1937 and 1933-34 to 1937/38	1939 and 1939- 1940	1938 and 1938- 1939	Average 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40	
	1939- 1940	1938- 1939	1933- 1934 to 1937- 1938	1939 and 1939-40	1939- 1940	1938- 1939	1933-34 to 1937/38	1939- 1940	1938- 1939	1933-34 to 1937-38	1939 and 1939-40	
	ooo acres	ooo acres	ooo acres	= 100	ooo centals	ooo centals	ooo centals	ooo bushels of 56 lb	ooo bushels of 56 lb	ooo bushels of 56 lb	= 100	
Albania . . .	230	216	...	...	...	3,116	2,795	...	5,564	4,991	...
Germany . . ⁽¹⁾	271	347 ^(*)	202	78.0	...	8,369 ^(*)	4,642	...	14,944 ^(*)	8,290	...	
*Bohemia- Moravia (Protect.) .	23	22	...	103.9	...	...	...	...	...	...	...
Bulgaria . .	1,527	1,731	1,720	88.2	...	11,735	19,756	...	20,955	35,278	...	
*Spain . . .	1,058	...	1,075	...	...	...	16,048	...	...	28,656	...
France . . .	814	841	844	96.8	...	12,756	11,301	...	22,779	20,181	...	
Greece . . .	683 ^(*)	671 ^(*)	625	101.9	5,766	4,398	5,663	10,296	7,853	10,112	131.1	
Hungary . .	3,150 ^(*)	2,901 ^(*)	2,840	...	49,624 ^(*)	58,688 ^(*)	47,080 ^(*)	88,615 ^(*)	104,801 ^(*)	84,072	...	
Italy . . . ⁽¹⁾	3,185	3,297	3,220	96.6	...	58,077	58,948	...	103,710	105,265	...	
Malta . . .	456	427	401	106.7	...	6,658	6,107	...	11,889	10,905	...	
Poland . . .	0	0	0	85.7	2	3	4	...	51	7	84.0	
Portugal . .	...	218	225	...	...	2,783	2,055	...	4,969	3,670	...
Romania . .	...	971	1,036	...	...	6,531	6,794	...	11,662	12,132	...
Romania . .	12,169	12,349	12,563	98.5	129,599	112,819	110,865	231,428	201,462	197,973	114.9	
Switzerland .	...	2	2	...	...	54	51	...	96	92	...
Yugoslavia .	6,575 ^(*)	7,022 ^(*)	6,708	93.6	81,443	104,849	98,225	145,434	187,232	175,403	77.7	
Total Europe	...	31,155	30,750	...	...	393,482	376,491	...	702,645	672,308	...
U. S. S. R. .	...	16,618	7,968	...	...	60,811 ^(*)	84,056	...	108,592 ^(*)	159,100	...
Canada . . .	183	180	159	101.7	4,534	4,306	3,485	8,097	7,690	6,223	105.3	
U. S. A. . . ⁽¹⁾	88,803	92,222	96,176	96.3	1,466,717	1,434,830	1,156,162	2,619,137	2,562,197	2,064,575	102.2	
Mexico . . . ⁽¹⁾	(78,861)	(82,710)	(77,139)	95.3	(321,634)	(289,828)	(993,335)	(236,0060)	(230,3265)	(177,3813)	102.5	
Total N. Am.	...	7,638	7,406	...	...	37,317	37,634	...	66,638	67,205	...
*China . . .	...	11,150	...	...	...	...	141,429	...	...	252,552	...
Korea . . .	...	342	302	...	...	2,174	2,134	...	3,882	3,811	...
Japan . . .	...	135	123	...	...	1,850	1,612	...	3,303	2,878	...
Manchukuo .	...	4,351	2,978	...	54,675	55,336	41,241	97,634	98,814	73,645	98.8
Palestine . .	...	21 ^(*)	16	...	...	177 ^(*)	161	...	315 ^(*)	287	...
Syria & Leb. .	49	48	52	101.3	...	606	538	...	1,081	961	...	
*Transjord. .	...	...	...	...	...	3	3	...	6	6	...
Turkey . . .	...	1,171	1,071	...	...	13,305	11,997	...	23,759	21,423	...
Total Asia	...	6,068	4,542	...	...	73,448	57,683	...	131,154	103,005	...
Algeria . . .	16	15	18	104.4	...	94	106	...	168	189	...	
Egypt . . . ⁽¹⁾	1,606	1,545	1,614	103.3	33,720	34,449	35,071	60,214	61,516	62,627	97.4	
Kenya . . . ⁽¹⁾	...	9	7	...	...	178	129	...	318	230	...
French Mo- rocco . . .	...	112	112	...	...	1,817	1,824	...	3,244	3,257	...
Anglo-Egypt. Sudan . . .	...	1,141	1,015	...	...	4,792	4,360	...	8,558	7,785	...
Tunisia . . . ⁽¹⁾	...	26	26	...	...	70	236	...	124	422	...
Total N. Afr.	62	43	52	145.2	...	121	126	...	217	224	...	
Argentina . .	...	2,891	2,844	...	...	41,521	41,852	...	74,145	74,734	...
Chile . . .	(17792)	(13097)	(16722)	135.8	...	107,233	183,495	...	191,488	327,671	...	
Uruguay . . .	...	8,654 ^(*)	11,228	...	...	1,399	1,380	...	2,498	2,464	...
Madagascar .	...	105	113	...	...	3,498	2,938	...	6,247	5,246	...
Un. of . . . ⁽¹⁾	...	247	224	...	...	2,205	2,063	...	3,937	3,684	...
S. Afr. . . ⁽¹⁾	...	6,682	5,764	...	...	52,396	33,488	...	93,564	59,800	...
New Zealand	...	6	7	...	...	6,126	8,534	...	10,939	15,240	...
TOTALS § . .	164,737	169,464	...	...	2,218,723	1,969,448	...	3,962,003	3,552,588	...	...

† The years indicated are those of the harvest, single years referring to the Northern Hemisphere, double years to the Southern. — * Not included in the total. — § In calculating the totals account has been taken of the probable area cultivated in some countries for which estimates of production are available but not those of area. — (1) Including Austria and Sudetenland. — (2) Excluding Sudetenland. — (3) For the former territory of Germany the production is estimated for the years 1933 to 1936. — (4) Average 1933-35. — (5) Area sown. — (6) Including the northern territory annexed by Hungary but excluding the Sub Carpathian territory. — (7) Frontiers as at the end of 1937. — (8) Maize sown in spring. — (9) Maize sown in summer. — (10) Area provided for by the Plan. — (11) Approximate estimate. — (12) Maize for all purposes. — (13) Maize harvested as grain. — (14) Average 1935-37. — (15) Nit. maize. — (16) Soft maize. — (17) European crops only. — (18) Maize and sorghum. — (19) Area harvested. — (20) Cultivation by natives.

CURRENT INFORMATION ON RICE.

Argentina: Rice sowing was finished in January with practically no change in the area in the provinces of Tucumán, Salta and Jujuy, a slight decrease in the west of Entre Ríos and an increase in the west of Corrientes and Formosa. The condition of the crops was good in general at the end of January.

Uruguay The last official report states that the rice crop was in good condition in January, the late frosts having caused only slight damage.

Burma: In Lower Burma the fourth estimates of the areas sown and matured show slight increases on the third. In Upper Burma the estimated area sown also shows a slight increase but, as a result of a larger increase in the estimate of that destroyed, the estimated area matured decreased. In the country as a whole the estimate of the matured area shows a slight decrease as compared with that of the third forecast

Area and Production of Rice.

COUNTRIES	AREA						PRODUCTION OF ROUGH RICE							
	1939-40	1938-39	Average 1933-34 to 1937-38	% 1939-40 1938- 1939 = 100		1939-40	1938-39	Average 1933-34 to 1937-38	1939-40	1938-39	Average 1933-34 to 1937-38	% 1939-40 1938- 1939 = 100		
ooo acres			ooo centals			ooo bushels of 45 lb								
Bulgaria	20	19	18	103.9	108.9	...	421	387	...	936	860	...	...
Greece . .	¹⁾ 6	¹⁾ 8	¹⁾ 3	77.8	189.1	102	209	47	227	464	103	49.0	219.7	
Italy . . .	366	367	344	99.8	106.5	¹⁾ 18,043	15,984	¹⁾ 40,094	35,519	...	...	...	...
Romania . .	1	—	—	117.0	—	13	...	29	...	...	...	...	...
United States	1,039	1,076	899	96.6	115.5	23,538	23,628	19,741	52,306	52,506	43,868	99.6	119.2	
Burma . . .	¹⁾ 12,089	12,532	12,343	96.5	97.9	¹⁾ 161,408	180,096	161,233	¹⁾ 358,684	400,213	358,295	89.6	100.1	
Chosen	...	4,068	4,090	...	...	58,605	98,769	81,317	130,232	219,483	180,701	59.3	72.1
French Indo- China:														
Annam (first semester).	1,075	1,180	1,021	91.1	105.4	8,003	8,199	8,531	17,784	18,220	18,958	97.6	93.8	
Toukin (5 th month)	...	1,205	1,186	...	...	14,897	14,727	13,216	33,103	32,726	29,368	101.2	112.7
India ⁴⁾	¹⁾ 69,301	¹⁾ 70,158	¹⁾ 67,850	98.8	102.1	...	...	...	...	...	...	...	...
Japan . . .	7,823	7,893	7,828	99.1	99.9	282,316	269,518	256,785	627,356	598,918	570,622	104.7	109.9	
Manchukuo	...	862	597	...	...	19,196	15,530	10,011	42,657	34,511	22,246	123.6	191.8
Taiwan	...	1,545	1,643	...	...	37,221	40,168	37,031	82,712	89,260	82,289	92.7	100.5
Thailand ⁵⁾	7,823	7,731	6,962	101.9	113.2	112,054	99,730	98,186	249,004	221,518	218,186	112.4	114.1	
Egypt	568	495	419	114.8	135.5	19,449	15,988	12,427	43,218	35,528	27,615	121.6	156.5	

(1) Area sown — (2) Production in 1939-40 is officially estimated at over 17,600,000 centals or 29,200,000 bushels — (3) Fourth report — (4) Second report — (5) First forecast

The estimated area destroyed is the highest since 1923-24. Disastrous floods and shortage of rain in the second half of October combined to reduce both the matured area and the production. The effect of the rain in Lower Burma during the latter part of November was probably mixed, the rain being disadvantageous to earlier varieties but advantageous to later varieties. Crop condition in mid-January remained the same in Lower Burma as in the third forecast but had fallen three points in Upper Burma, caus-

ing a fall of one point for the country as a whole. It was expected that the medium-lived crop would be generally light; the long-lived crop was expected to be light in Upper Burma but good in Lower Burma.

Probable exports were estimated at 3,300,000 metric tons of white rice and rice products.

India: Harvesting of winter paddy was generally completed in the first decade of January and threshing continued during the month.

Netherlands Indies: Java and Madura. — The Department of Agricultural Statistics of the Central Statistical Office communicates the following details on the rice area —

	1939	1938 acres
<i>Area harvested in December —</i>		
Wet padi	199,900	167,000
Dry padi	3,000	3,500
<i>Area harvested from January 1 to December 31:</i>		
Wet padi	8,984,100	8,842,800
Dry padi	926,900	961,300
<i>Area of standing crops at the end of December:—</i>		
Wet padi	2,080,700	2,226,700
Dry padi	771,700	829,300

Indochina: Rice crop condition and prospects in December 1939 — Harvesting of tenth month rice was continued in Annam; the yield in the north was satisfactory on the whole: it was good or normal in the centre, except in some flooded low-lying fields where the loss was estimated at 20 to 30 per cent; the late rices also suffered from excess of water and harvesting was done hurriedly to avoid floods, in the south the yield was generally average or poor; in the extreme south harvesting had begun in some places and floods had caused damage in fields in ear. Twelfth month rice was earing early in December and promised a good crop which was expected to be harvested at the end of January. First month rice showed good growth and tillering was taking place. Preparations for third month rice were progressing and the beds looked well. Planting out was done in good conditions and growth continued regularly.

In Cochinchina harvesting of early rice was under way and yields were generally good. Season and mid-season rice was in flower or ripening and harvesting had begun in the centre. After-flood rice was being sown and planting out of second crop was finished. Floating rice in the west looked normal outside areas where there had been flood damage and some lots were in flower.

In Cambodia rice planted out in October had sufficient water for normal development. Sowing and planting out of after-flood rice were favoured by rain and were effected on a large scale. Harvesting of mid-season rice began in most parts, yields appeared to be slightly below those of last year. The harvesting of season rice began at the end of December. Flowering was adversely affected by rain in some places. The crops were laid in many of the flooded areas.

CURRENT INFORMATION ON POTATOES.

Area and Production of Potatoes.

COUNTRIES	AREA					PRODUCTION							
	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1937-38	% and 1939 and 1939-40		1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1937-38	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1937-38	% and 1939 and 1939-40	
					Average 1939 age = 100								Average 1939 age = 100
	000 acres					000 centals			000 bushels of 60 lb.				
Albania . . .	...	...	0	...	...	34	...	...	57	...	...	...	...
Germany ^(s) . . .	335	428	⁽²⁾ 777	⁽¹⁾ 78.1	100.9	38,361	44,754	⁽²⁾ 41,849	63,933	74,558	⁽²⁾ 69,245	85.7	110.9
Belgium . . .	7,488	7,618	7,777	98.3	...	120,240	1,198,878	1,118,409	2,003,969	1,998,090	1,863,977	100.3	...
Bohemia- Moravia ^(s) . . .	363	364	398	99.7	91.4	...	71,836	71,759	...	119,725	119,596	...	...
(Protecto- rate) ^(t) . . .	40	39	—	102.5	—	...	...	—	...	...	—	...	—
Bulgaria . . .	828	821	—	100.8	—	...	...	—	...	...	—	...	—
Denmark . . .	49	49	40	99.0	122.4	...	1,401	2,384	...	2,334	3,974	...	...
Spain . . .	168	196	190	85.9	88.5	24,912	31,586	28,793	41,520	52,642	47,988	78.9	86.5
Estonia . . .	1,006	...	⁽³⁾ 1,127	...	89.3	⁽³⁾ 110,723	⁽³⁾ 184,534	...	...
Finland . . .	220	193	180	114.0	122.3	19,274	21,994	20,944	32,123	36,656	34,906	87.6	92.0
France . . .	219	211	208	103.9	105.6	34,304	26,409	28,707	57,172	44,014	47,844	129.9	119.5
Greece . . .	3,415	3,521	3,496	97.0	97.7	...	381,721	339,176	...	636,189	565,281	...	...
Hungary . . .	56	53	49	105.4	113.6	3,591	3,153	2,857	5,895	5,254	4,761	113.9	125.7
Ireland . . .	⁽⁴⁾ 778	⁽⁵⁾ 720	720	—	—	⁽⁴⁾ 52,131	⁽⁵⁾ 47,193	⁽⁵⁾ 45,758	⁽⁴⁾ 86,883	⁽⁵⁾ 78,653	⁽⁵⁾ 76,261	...	...
Italy . . .	...	327	336	...	...	...	55,123	57,103	...	91,872	95,172	...	...
Latvia . . .	83	84	⁽⁶⁾ 73	98.6	113.1	7,240	8,015	5,826	12,066	13,358	9,710	90.3	124.3
Lithuania . . .	959	956	971	100.3	98.8	...	57,000	54,251	...	94,998	90,417	...	...
Luxembourg . . .	359	340	288	105.5	124.7	36,525	38,611	33,964	60,873	64,350	56,606	94.6	107.5
Malta . . .	437	460	444	95.1	98.4	45,809	46,699	47,013	76,347	77,830	78,354	98.1	97.4
Norway . . .	43	43	41	99.8	103.5	5,776	6,296	3,982	9,626	10,492	6,636	91.7	145.0
Netherlands: for consumption . . .	9	9	8	98.4	102.8	693	629	560	1,156	1,049	933	110.2	123.9
Poland . . .	...	132	124	...	...	20,743	20,671	19,842	34,571	34,452	33,070	100.3	104.5
Portugal . . .	237	224	287	105.6	82.4	...	43,509	46,674	110,229	72,513	77,788	106.4	108.6
Romania: single crop . . .	71	76	61	93.5	116.1	66,139	18,672	14,219	...	31,119	23,697	...	...
Switzerland . . .	7,562	7,487	7,039	101.0	107.4	...	761,881	744,303	...	1,269,777	1,240,480	...	...
Yugoslavia . . .	...	...	80	...	...	...	13,068	12,353	...	21,779	20,587	...	...
U. S. S. R. . .	512	476	515	107.6	99.5	39,992	36,695	39,902	66,652	61,157	66,503	109.0	100.2
United Kingdom: England & Wales . . .	...	226	226	...	...	...	3,027	3,373	...	5,046	5,621	...	...
Scotland . . .	454	475	476	95.6	95.3	74,189	78,086	70,497	123,648	130,144	117,495	95.0	105.2
Northern Ireland . . .	134	135	139	99.4	96.7	...	20,563	21,952	...	34,272	36,587	...	...
Sweden . . .	115	123	133	93.2	86.8	...	15,935	19,761	...	26,558	32,934	...	...
Switzerland . . .	336	338	327	99.4	103.0	41,189	41,283	41,708	68,648	68,803	69,513	99.8	98.8
Yugoslavia . . .	125	123	116	101.2	107.2	14,683	17,882	16,760	24,471	29,802	27,933	82.1	87.6
U. S. S. R. . .	...	658	635	...	...	...	37,515	34,534	...	62,524	57,556	...	...
Canada . . .	...	16,578	16,875	...	...	...	925,063	1,266,119	...	1,541,740	2,110,156	...	...
United States . . .	518	522	527	99.2	98.2	36,390	35,938	42,334	60,650	59,897	70,557	101.3	86.0
Mexico . . .	3,032	3,023	3,359	100.3	90.3	216,595	224,497	223,440	360,992	374,163	372,401	96.5	96.9
Cyprus . . .	...	40	32	...	...	...	1,575	1,287	...	2,624	2,311	...	...
Japan . . .	...	6	6	...	...	504	504	479	...	840	799	100.0	105.2
Palestine . . .	...	396	358	...	...	...	40,743	33,672	...	67,904	56,119	...	...
Syria and Le- banon . . .	...	2	2	...	...	...	193	89	...	322	148	...	...
Turkey . . .	...	19	18	...	...	...	918	885	...	1,530	1,475	...	...
Algeria . . .	...	134	127	...	...	...	3,717	3,514	...	6,194	5,857	...	...
Egypt . . .	22	17	17	125.7	131.1	1,370	1,470	995	2,284	2,450	1,658	93.2	137.7
Tunisia . . .	26	26	23	100.5	111.6	...	1,734	1,389	...	2,890	2,315	...	...
Argentina . . .	...	10	8	...	...	...	942	814	...	1,570	1,356	...	...
Chile . . .	7	7	5	100.0	147.1	...	121	152	...	202	254	...	...
Union of South Africa . . .	...	309	296	...	...	...	15,704	14,728	...	26,172	24,546	...	...
New Zealand . . .	...	134	126	...	...	...	10,728	10,142	...	17,879	16,903	...	...
...	...	85	...	...	...	...	3,811	3,424	...	6,352	5,706	...	...
...	20	18	23	109.8	85.0	...	1,964	2,842	...	3,273	4,736	...	...

(s) Early potatoes. — (t) Late potatoes. — (1) Including Ostmark and Sudetenland. — (2) Average 1932 to 1937. — (3) Average 1933-1935. — (4) Including the northern region annexed by Hungary, but not including Sub-Carpathian Russia. — (5) Territory at the end of 1937. — (6) Average 1935 to 1937. — (7) Area provided for by the Plan.

PRODUCTION OF CANE-SUGAR IN 1939-40.

The following table is based on the information received by the Institute on the probable production of cane-sugar in the current season. The countries included produce more than nine-tenths of the world total.

Production of Cane-Sugar.

COUNTRIES	1939-40 (1)	1938-39	Average of 1933-34 to 1937-38	1939-40 (1)	1938-39	Average of 1933-34 to 1937-38	% 1939-40	
	ooo centals			short tons			1938-39 = 100	Average = 100
AMERICA								
Antigua.	304	493	514	15,200	24,640	25,688	62	59
Argentina	11,288	10,141	8,147	564,000	510,000	407,341	111	139
Barbados	2,866	3,505	2,517	140,000	175,250	125,843	82	114
Brazil.	26,896	25,353	23,161	1,340,000	1,270,000	1,158,050	106	116
Cuba	62,567	61,730	57,752	3,128,000	3,100,000	2,887,585	101	108
Ecuador	540	489	413	27,000	24,500	20,657	110	131
United States (La. & Fl.)	10,362	11,601	7,187	570,000	560,000	359,350	89	144
British Guiana	4,299	4,189	3,978	215,000	210,000	198,899	103	108
Jamaica	2,608	2,642	2,086	130,400	132,100	104,278	99	125
Martinique.	1,323	1,433	1,104	70,000	72,000	55,206	92	120
Mexico	6,834	7,772	6,037	340,000	388,602	301,854	88	113
Peru	8,686	8,157	8,702	434,000	410,000	435,102	106	100
Puerto Rico	22,046	17,637	18,515	1,000,000	900,000	925,750	125	119
Dominican Republic	9,921	9,502	9,030	500,000	475,000	451,474	104	110
St. Kitts	584	836	659	29,200	41,816	32,944	70	89
Trinidad	2,866	2,877	2,983	140,000	143,870	149,129	100	96
Venezuela	551	540	489	28,000	27,000	24,472	102	113
Total America	174,541	168,897	153,274	8,620,800	8,484,778	7,663,642	103	114
ASIA.								
Taiwan	29,740	32,915	19,895	1,487,000	1,646,000	994,719	90	149
India	61,112	45,534	59,190	3,056,000	2,276,700	2,959,355	134	103
Japan	3,386	3,596	2,359	169,300	179,800	117,951	94	144
Java	35,274	34,392	19,839	1,800,000	1,720,000	991,927	103	178
Philippines	24,912	22,708	23,455	1,230,000	1,140,000	1,172,739	110	106
Total Asia	154,424	139,145	124,738	7,762,300	6,962,500	6,236,791	111	124
AFRICA.								
Egypt.	3,417	3,573	3,190	171,000	178,634	159,001	96	107
Mauritius	5,534	7,084	5,886	277,000	354,180	294,310	78	94
Reunion	1,764	1,764	1,745	90,000	90,000	87,267	100	101
Union of South Africa	11,464	11,616	9,426	570,000	580,800	471,280	99	172
Total Africa	22,179	24,037	20,237	1,108,000	1,203,614	1,011,858	92	110
OCEANIA.								
Australia	18,298	18,298	15,933	910,000	910,000	796,647	100	115
Hawaii	19,070	19,158	18,961	953,000	958,000	948,051	100	101
Fiji Islands	2,844	2,853	2,912	142,000	142,600	145,602	100	98
Total Oceania	40,212	40,309	37,806	2,005,000	2,010,600	1,890,300	100	106
TOTALS	391,356	372,388	336,055	19,496,100	18,661,492	16,802,591	105	116

(1) Approximate data.

These first estimates show that cane-sugar production was slightly larger than it was in 1938-39 and distinctly above the average of the preceding five years. The increase occurred mainly in Asia owing to the unexpected increase

in the Indian crop of 34 per cent. on that of last year, this largely offsetting the decline in Taiwan and Japan.

There were decreases in most of the American countries, but appreciable increases in Argentina, Peru, Puerto Rico, the Dominican Republic and to a smaller extent in Cuba will be enough to bring the total production of America up to a level above that of 1938-39.

The three countries of Oceania which appear in the table are the principal cane-sugar producing countries and all three report crops practically equal to those of the preceding year.

Africa is the only continent to report a decrease from last year, mainly owing to a decline of more than one-fifth in Mauritius. This substantial reduction in Mauritius is the effect of drought and cyclone damage to the sugar content.

Despite this decline in Africa the general total of cane-sugar production in the four continents is 5 per cent. larger than that of last year and 16 per cent. above the average of the five years 1933-34 to 1937-38.

CURRENT INFORMATION ON SUGAR.

Area and Production of Sugar-Beet.

COUNTRIES	AREA					PRODUCTION							
	1939	1938	Average 1933 to 1937	% 1939		1939	1938	Average 1933 to 1937	1939	1938	Average 1933 to 1937	% 1939	
				1938	Average = 100							1938	Average = 100
ooo acres					ooo centials			ooo short tons					
							(a)						
Germany (1) .	1,402	1,394	2) 1,037	100.6	135.4	383,385	379,196	274,476	19,169	18,960	(2) 13,724	101.1	139.7
Belgium . . .	134	122	126	109.6	106.2	...	26,492	33,546	...	1,325	1,677	..	...
Bohemia- Moravia (Protect.) . .	289	287	—	100.5	—	—	—	—	—	—	—	—	—
Bulgaria . . .	29	29	18	99.4	158.3	...	2,834	3,346	...	142	167	...	...
Denmark (3) .	95	94	101	100.8	93.8	35,054	30,049	35,188	1,753	1,502	1,759	116.7	99.6
Finland (4) .	14	13	7	112.9	193.7	...	2,885	1,750	...	144	87	...	...
France (5) . .	(6) 824	787	784	104.3	105.0	...	176,037	195,304	...	8,802	9,765	...	...
Hungary . . .	(7) 130	(8) 109	(8) 114	—	—	(7) 23,840	(8) 21,372	(8) 21,043	(7) 1,192	(8) 1,069	(8) 1,052	—	—
Ireland . . .	...	51	48	...	...	...	9,329	11,172	...	466	559	...	...
Italy	368	336	256	109.8	144.0	...	71,723	58,499	...	3,586	2,925	...	...
Latvia . . . .	...	34	34	...	...	...	5,085	5,916	...	255	296	...	...
Lithuania . .	22	20	15	108.0	141.3	...	3,755	2,819	188	158	141	118.6	133.2
Netherlands .	113	108	106	105.1	106.1	37,258	33,499	37,393	1,863	1,675	1,870	111.2	99.6
Poland . . . .	...	372	296	...	...	...	69,720	56,087	...	3,846	2,804	...	...
Romania . . .	131	117	87	112.0	151.2	17,042	16,116	12,689	852	806	635	105.8	134.3
Unit King : Engl. and W. Scotland . . .	337	329	356	102.5	94.6	...	47,936	74,238	...	2,397	3,712	...	...
Sweden	7	7	6	101.5	121.9	...	1,411	1,297	...	71	65	...	...
Switzerland .	125	125	128	100.0	98.2	41,885	40,430	41,638	2,094	2,021	2,082	103.6	100.6
Switzerland .	9	7	4	122.0	204.0	2,425	2,050	1,521	121	103	76	118.3	159.4
Yugoslavia . .	114	73	69	156.4	164.9	...	12,290	11,002	...	614	550	...	...
U. S. S. R. . .	9) 2,928	2,917	2,999	100.4	97.6	463,343	367,732	331,786	23,167	18,386	16,589	126.0	139.7
Canada	61	48	51	128.4	121.6	12,100	10,540	9,466	605	527	473	114.8	127.8
U. S. A.	921	930	809	99.0	113.8	213,820	232,300	177,076	10,691	11,615	8,854	92.8	120.8
Turkey . . . .	...	52	63	...	...	...	6,054	8,326	...	303	416	...	...

(1) Including Ostmark and Sudetenland. — (2) Average 1932 to 1937. — (3) Not including crops for seed. — (4) Sugar-beet for factories. — (5) Including beets for distilling. — (6) Estimated on June 1. — (7) Present frontiers excluding Sub-Carpathian Russia. — (8) Territory at the end of 1937. — (9) Calculated.

Production of Beet-Sugar (raw).

COUNTRIES	PRODUCTION (Sept. 1 - January 31)		TOTAL PRODUCTION DURING THE SEASON			% 1939-40	
	1939-40	1938-39	1939-40 (1)	1938-39	Average 1933-34 to 1937-38	1938-39 = 100	Average = 100
	thousand centals						
Germany . . . . .	...	...	2) 50,791	46,959	42,760	108	119
Bohemia-Moravia . . . . .	...	...	10,278	11,585	14,167	99	81
Slovakia . . . . .	...	...	1,184				
Belgium	3) 5,779	3) 4,242	5,953	4,244	5,400	140	110
Bulgaria	3) 555	3) 436	772	476	441	162	175
Denmark . . . . .	...	...	5,357	4,026	4,491	133	119
Spain . . . . .	...	...	2,447	1,984	5,051	123	48
Finland . . . . .	...	...	331	337	213	98	155
France . . . . .	...	...	22,779	18,426	21,836	124	104
Hungary	3) 2,872	3) 2,464	2,877	2,807	2,765	103	104
Ireland	3) 1,395	3) 1,163	1,396	1,334	1,705	105	82
Italy . . . . .	...	...	10,296	8,768	7,415	117	139
Latvia . . . . .	...	...	882	816	1,024	108	86
Lithuania	529	458	600	458	447	131	134
Netherlands	3) 5,083	3) 4,458	5,181	4,521	5,323	115	97
Poland . . . . .	...	...	9,480	12,037	9,933	79	95
Romania	3) 3,132	3) 3,364	3,748	3,682	2,444	102	153
United Kingdom . . . . .	...	...	12,103	7,407	12,036	163	101
Sweden . . . . .	...	...	6,746	6,446	6,687	105	101
Switzerland . . . . .	...	...	326	287	212	114	154
Yugoslavia . . . . .	...	...	2,646	1,896	1,612	140	164
<i>Total Europe (a)</i> . . . . .	..	...	156,173	138,496	145,962	113	107
U. S. S. R. . . . .	..	..	52,911	48,502	39,431	109	134
<i>Total Europe (b)</i> . . . . .	..	..	209,084	186,998	185,393	112	113
Canada	—	—	1,852	1,626	1,459	114	127
United States	—	—	34,390	36,059	28,158	95	122
<i>Total North America</i>	—	—	36,242	37,685	29,617	96	122
Japan	—	—	816	1,096	873	74	93
Manchukuo	—	—	463	463	129	...	...
Turkey	—	—	2,315	1,042	1,449	222	160
<i>Total Asia</i>	—	—	3,131	2,138	2,322	146	135
GENERAL TOTALS	(a) —	—	195,546	178,319	177,901	110	110
(b) —	—	—	248,457	226,821	217,332	110	114

(a) Not including U. S. S. R. — (b) Including U. S. S. R. — (1) Approximate data. — (2) Licht's estimate. — (3) Production to the end of December.

France: According to information received from northern districts, the efforts made in the autumn to lift sugar-beet were more successful than was at first believed, and cases of beet being lost through frost are fewer than was estimated. For the new season work has not yet begun, no winter ploughing having been possible owing to the severe weather. (*Journal du Commerce, Paris*).

Yugoslavia: The fixing by a recent special decree of much higher minimum sugar-beet prices than last year has aroused considerable interest in this crop amongst farmers. It is forecast that this measure will result in a considerable extension of the area under sugar-beet during the coming season.

Netherlands Indies The western monsoon blew during the first half of January, causing some flooding. In certain districts the cane was lodged, but on the whole the condition of plantations was good (*Aneta*).

Egypt: The sugar-cane crop is maturing in favourable weather conditions. Progress is being made with cutting and delivery of sugar-cane to factories, which began to operate at the beginning of January. The yield per acre is normal. The land was being prepared for the planting of the new crop in Qena and Aswan, and some lots were planted in January

CURRENT INFORMATION ON VINES.

Germany According to the census of May 1939, the area of vineyards in 1939 was 311,800 acres against 316,000 in 1938, percentage 98.6

United States The estimates of grape production in the United States in 1939, as reported in the December Crop Report of the United States, are reproduced below with the estimates for 1938 and the averages of the preceding five years.

Production of Grapes.

	1939	1938	Average 1933-37	1939	1938	Average 1933-37	% 1938 = 100	% 1939 Average = 100
	(000 short tons)			(000 centals)				
Total U. S . .	2,471	2,704	2,198	49,411	54,071	43,954	91.4	112.4
including								
California. . .	2,173	2,531	1,944	43,460	50,620	38,888	85.9	111.8
Wine variety .	548	641	514	10,960	12,820	10,280	85.5	106.6
Table variety	370	447	346	7,400	8,940	6,924	82.8	106.9
Raisin variety	1,255	1,443	1,084	25,100	28,860	21,684	87.0	115.8
Dried (1) . . .	(252)	(290)	(200)	(5,040)	(5,800)	(3,992)	(86.9)	(126.3)

(1) Dry basis

WORLD LINSEED PRODUCTION IN 1939-40.

The new estimates of linseed production in 1939-40 and the revisions of preliminary estimates received by the Institute since the publication of the December Crop Report, in which a forecast of world production of linseed was given, involve only negligible modifications in the total for the Northern Hemisphere.

In Europe the provisional estimate of Estonia is identical with our forecast of a crop of about 150,000 centals (270,000 bushels), which was calculated on the basis of crop condition at the time of the harvest. The revised estimate of Lithuanian production, with only a slight increase, practically confirms the

Area and Production of Flax.

COUNTRIES	† AREA					† PRODUCTION							
	1939	1938	Aver	% 1939		1939	1938	Aver	1939	1938	Aver	% 1939	
	and	and	to 1937	and		and	and	to 1937	and	and	to 1937	and	
	1939-40	1938-39	1933-34	1938	Aver-	1939-1940	1938-1939	1933-34	1939-40	1938-39	1933-34	1938 and 1939	Aver.
	ooo acres					ooo centals			ooo lb			= 100	= 100
			to 1937	and	age			to 1937			to 1937		
			1937-38	1939	= 100			1937-38			1937-38		
<i>Fibre.</i>													
Germany (1)	144	136 ²⁾	73	105.6	—	...	661 ²⁾	449	...	66,139 ²⁾	44,908	...	...
Belgium . . .	110	77	58	143.5	189.6	...	781	356	...	78,064	35,593	...	...
Bohemia- Moravia (Pr.)	11	10	—	116.0	—	—	—	—	—	—	—	—	—
Bulgaria . . .	9	8	5	117.9	175.3	...	6	6	...	604	619	...	...
Estonia . . .	57	58	63	98.5	90.8	135	168	184	13,482	16,798	18,396	80.3	73.3
Finland (1)	8	7	11	104.7	72.5	...	22	33	...	2,218	3,336	...	...
France . . .	...	94	69	...	...	...	525	392	...	52,493	39,180	...	...
Hungary . . .	10	8 ²⁾	8	—	—	47	35 ²⁾	31	4,718	3,463 ²⁾	3,088	—	—
Ireland . . .	...	4	3	...	...	...	15	15	...	1,460	1,537	...	...
Italy . . .	37 ²⁾	30 ²⁾	24	125.4	154.0	...	80	51	...	7,974	5,091	...	...
Latvia . . .	152	162	144	94.0	105.4	...	473	419	...	47,316	41,901	...	...
Lithuania (1)	205	192	183	106.6	112.2	629	568	588	62,898	56,844	58,760	110.7	107.0
Netherlands .	62	51	25	120.4	243.7	390	429	197	39,048	42,935	19,671	90.9	198.5
Poland . . .	...	365	298	...	...	...	872	761	...	87,229	76,113	...	...
Romania . . .	28	37	62	74.6	44.9	...	140	194	...	13,950	19,361	...	...
Un Kingd. N Ireland .	21	21	20	103.2	108.5	...	90	98	...	9,041	9,838	...	...
Yugoslavia . .	...	35	30	...	...	...	285	236	...	28,478	23,617	...	...
U S S R. (1)	...	4,650	5,351	...	...	13,963	12,037	12,266	396,324	1,203,728	1,226,634	116.0	113.8
Japan . . .	...	62	37	...	...	...	194	98	...	19,382	9,798	...	...
Egypt . . .	10	9	5	104.5	192.8	81	71	34	8,142	7,071	3,433	115.1	237.2

Linseed.

						ooo bushels of 56 lb							
	1939	1938	Aver	% 1939		1939	1938	Aver	1939	1938	Aver	% 1939	
	and	and	to 1937	and		and	and	to 1937	and	and	to 1937	and	
	1939-40	1938-39	1933-34	1938	Aver-	1939-1940	1938-1939	1933-34	1939-40	1938-39	1933-34	1938 and 1939	Aver.
	ooo acres					ooo centals			ooo lb			= 100	= 100
			to 1937	and	age			to 1937			to 1937		
			1937-38	1939	= 100			1937-38			1937-38		
*Germany (1)	144	136 ²⁾	73	105.6	—	...	522 ²⁾	454	...	933 ²⁾	810	...	...
*Belgium . . .	118	77	58	143.5	189.6	...	355	263	...	634	470	...	...
*Bohemia- Moravia (Pr.)	11	10	—	116.0	—	—	—	—	—	—	—	—	—
*Bulgaria . . .	9	8	5	117.9	175.3	...	18	22	...	32	40	...	...
*Estonia . . .	57	58	63	98.5	90.8	152	196	195	271	350	348	80.3	73.3
*France . . .	...	94	69	...	...	...	239	...	...	...	426	...	...
*Hungary . . .	18	21 ²⁾	21	...	...	138	154 ²⁾	113 ²⁾	246	276 ²⁾	201	...	...
*Italy . . .	37 ²⁾	30 ²⁾	24	125.4	154.0	...	147	68	...	263	121	...	...
*Latvia . . .	152	162	144	94.0	105.4	532	450	352	949	803	699	118.2	135.8
*Lithuania (1)	205	192	183	106.6	112.2	703	650	695	1,255	1,161	1,240	108.1	101.2
*Netherlands .	62	51	25	120.4	243.7	...	364	170	...	649	304	...	...
*Poland . . .	...	365	298	...	...	...	1,508	1,403	...	2,692	2,506	...	...
*Romania . . .	28	37	62	74.6	44.9	...	122	230	...	217	411	...	...
*Yugoslavia . .	...	—	—	...	...	...	30	25	...	53	44	...	...
Total Europe	432	433	411	100.6	105.4	1,525	1,450	1,395	2,721	2,590	2,488	105.2	109.5
*U S S R. (1)	...	5,605	6,030	...	...	...	10,952	...	...	10,952	28,486	...	...
Canada . . .	307	221	299	138.8	102.6	1,215	705	647	2,169	1,259	1,156	172.3	187.7
United States .	2,284	936	1,298	244.0	175.9	11,385	4,565	4,418	20,330	8,152	7,889	249.4	257.7
*Mexico . . .	...	12	12	...	...	...	48	51	...	85	90	...	...
Total N. Am.	2,591	1,157	1,597	223.5	162.2	12,600	5,270	5,055	22,499	9,411	9,045	239.0	248.7
India . . .	3,894	3,890	3,428	100.1	113.6	9,968	10,326	8,982	17,800	18,440	16,040	96.5	111.0
Egypt . . .	10	9	5	109.5	192.8	59	61	39	106	108	69	97.5	153.7
*Fr Morocco .	...	56	41	...	...	...	112	165	...	201	294	...	...
Argentina . . .	7,600 ¹¹⁾	6,608 ¹¹⁾	7,198	115.0	105.6	24,846	31,085	37,920	44,368	55,510	67,714	79.9	65.5
Uruguay . . .	546	452	332	120.7	164.6	2,628	2,478	1,795	4,693	4,425	3,205	106.4	146.4
Totals . . .	15,073	12,549	12,971	120.1	116.2	51,626	50,670	55,200	92,187	90,484	98,561	101.9	93.5

† The years indicated are those of the harvest, single years referring to the Northern Hemisphere, double years to the Southern. — * Not included in the totals. — (1) Including Ostmark and Sudetenland. — (2) Not including Sudetenland. — (3) Flax and hemp. — (4) Present frontiers excluding Sub-Carpathian Russia. — (5) Average 1934 to 1937. — (6) Total area (for fibre and for seed). — (7) Dolgunetz variety. — (8) Dolgunetz and Kudriash varieties. — (9) Area according to the Plan. — (10) Average 1933 to 1935. — (11) Area sown.

previous estimate, which was about average. Total European production, which was estimated in December at 5,100,000 centals (9,055,000 bushels), is accordingly unchanged, exceeding by about 220,000 centals (280,000 bushels) the 1938 production and by 660,000 centals (1,180,000 bushels) the average of the five years ending 1937. Despite its size, the 1939 European crop of linseed has not reached the level that the increase in the acreage under cultivation and the generally favourable season led to suppose, owing principally to the considerable reduction in the Polish crop, which was seriously affected by the war.

World Production of Linseed.

(1,000 bushels of 56 lb.)

CONTINENTS	1939 40	1938-39	1937 38	1936-37	1935-36	1934-35	Average 1929-30/ 1933-34
North and Central America .	22,601	9,578	7,992	7,204	16,299	6,693	16,173
South America	49,085	59,958	64,367	79,249	62,478	83,146	71,942
Argentina	(44,368)	(55,510)	(60,604)	(76,202)	(59,446)	(79,721)	(68,403)
Asia (1)	18,338	18,972	17,322	16,023	17,204	15,354	15,547
Europe (2)	9,055	8,771	9,763	10,039	8,622	6,338	6,543
U. S. S. R.			3)	30,314	29,133	27,019	30,066
Africa	433	374	535	496	366	468	559
Oceania	24	24	16	12	31	39	91
GENERAL TOTALS							
EXCLUDING U. S. S. R. .	99,536	97,677	99,995	113,023	105,000	112,038	110,855
INCLUDING U. S. S. R. . .	.	...	...	143,337	134,133	139,057	140,921

Excluding U. S. S. R. and China — (2) Excluding U. S. S. R. — (3) Unofficial data.

For the U. S. S. R. no estimate of production is yet available; the latest information, however, confirms good to excellent yields.

The total production of North America is also practically unchanged, the final estimate of Canadian outturn, published last month, having raised the previous estimate by only 13,000 centals (24,000 bushels). In the United States the December estimate remains unchanged. The production of these two countries of North America in 1939 thus totals 12,600,000 centals (22,499,000 bushels), against 5,270,000 (9,411,000) in 1938 and a preceding five-year average of 5,065,000 (9,045,000). The size of this crop is due both to the large increase in acreage compared with preceding years and the very favourable season.

The figure of Asiatic production, calculated in December, remains unchanged: 10,269,000 centals (18,338,000 bushels), against 10,624,000 (18,972,000) in 1938 and an average in 1933-37 of 9,226,000 (16,476,000). The estimate of total production in Africa is also unchanged, an average crop, slightly higher than that of 1938, being confirmed.

In regard to the Southern Hemisphere, the new estimates recently received from the Governments of Argentina and Uruguay extensively revise the preliminary crop estimates published in December. Threshing results in Argentina

have everywhere been poor, the fall between the first and second estimates amounting to 2,710,000 centals (4,840,000 bushels), or about 10 per cent. Linseed production in this country, now estimated at 24,846,000 centals (44,368,000 bushels), against 31,085,000 (55,510,000) in 1938-39 and a previous five-year average of 37,920,000 (67,714,000), is the smallest crop since the Great War with the exception of that of 1921-22. This crop was obtained from an acreage which was 15 per cent. larger than that of 1938-39 and 5.6 per cent. above the average; the exceptionally low production this season is accordingly due to the damage resulting from the various unfavourable seasonal conditions, particularly the excessive rainfall of October and November, insect infestation and the late frosts.

Uruguay has also reduced by 256,000 centals (457,000 bushels) its previous estimate. The crop of this country however, estimated at 2,628,000 centals (4,693,000 bushels), in spite of the damage suffered, is 6.4 per cent. greater than that of 1938-39 and 46.4 per cent. above the average, owing principally to the extensive increase in acreage.

Briefly, world linseed production in 1939-40 (excluding the U. S. S. R. and China) may now be estimated at 55,740,000 centals (99,536,000 bushels), a drop of 2,900,000 (5,100,000) on the December estimate, due, as we had anticipated, to the reduction in the estimates of the Argentine and Uruguayan crops. Nevertheless, world linseed production this season is about 1,100,000 centals (2,000,000 bushels) larger than the 1938-39 production (54,700,000 centals or 97,677,000 bushels), but is 2,900,000 (5,100,000) smaller than the previous five-year average (58,600,000 centals or 104,700,000 bushels).

A. DI FULVIO.

CURRENT INFORMATION ON FLAX.

Ireland. Flax scutching carried out in December indicated that the 1939 crop was above the average both in yield and quality. Fibre yields varied from 500 to 550 lb. per acre

Romania: As part of a general economic plan and in consideration of the difficulties of trading, the Ministry of Agriculture has taken steps to expand the cultivation of textile plants this season. Adequate quantities of seed will be distributed to growers by the agricultural authorities, with facilities for payment.

India: In the Central Provinces, the principal area of production, slight damage was done in Sangor and Jubbulpore by the frost in the week ending January 13. Cool breezes had an adverse effect in Nagpur. In the week ending January 20 there were light showers and in the following week the weather was cool and cloudy.

In Bihar light rain fell in Champaran, Saran and Manbhum in the latter half of January. Rain was needed in Gaya and Patna but on the whole the crop was doing well.

CURRENT INFORMATION ON COTTON.

Romania: See under flax.

Indochina: Seeding this year in Cambodia is larger than last, but not to such an extent as was at first believed. The total area sown up to December was at

least 5,000 acres. On red soils growth was good and fruit formation was beginning. In the river basins growth is average. The condition of groundnuts and haricot beans planted between rows was normal. In Annam the luxuriant growth of cotton plants promised a good crop and the first picking of bolls had begun in some districts. Crops planted along river basins were seriously compromised by floods.

Area and Production of Cotton.

COUNTRIES	AREA					PRODUCTION OF GINNED COTTON											
	1939-40	1938-39	Average 1933-34 to 1937-38	% 1939-40		1939- 1940	1938- 1939	Average 1933-34 to 1937-38	1939- 1940	1938- 1939	Average 1933-34 to 1937-38	% 1939-40					
				1938- 1939	Average							1938- 1939	Average				
														1937-38	Average	1937-38	Average
ooo acres			= 100 = 100		ooo centals			ooo bales of 478 lb.			= 100 = 100						
Bulgaria	166	136	78	122.2	212.6	...	153	138	...	32	29	...	...		
Greece	191	187	121	102.1	157.6	300	321	240	63	67	50	93.4	125.1				
Italy . . . . .	...	91	20	...	...	...	209	37	...	44	8	...	...		
Romania	21	12	3	170.9	621.4	28	13	5	6	3	1	222.2	534.6				
Yugoslavia	14	14	4	100.3	312.9	...	27	7	...	6	1	...	...		
U. S. S. R.	5,190	5,147	4,977	100.8	104.3	19,400	18,500	12,900	4,050	3,870	2,707	104.8	149.9				
United States (1)	23,928	24,248	29,427	98.7	81.3	56,366	57,094	61,821	11,792	11,944	12,933	98.7	91.2				
Br. West Indies . . . . .	...	22	17	...	...	...	21	19	...	4	4	...	...		
Mexico . . . . .	...	633	623	...	...	...	1,462	1,405	...	306	294	...	...		
Argentina	(2) 903	(*) 1,005	(2) 832	89.8	108.5	...	1,455	1,195	...	304	250	...	...		
Brazil: North	2,350	2,224	2,295	105.6	102.3	3,307	3,064	3,293	692	641	689	107.9	100.4				
do : South . . . . .	...	3,700	2,461	...	...	...	5,861	4,297	...	1,226	899	...	...		
Peru . . . . .	...	395	377	...	...	...	1,912	1,696	...	400	355	...	...		
Burma	(2) 372	(2) 411	(2) 494	90.6	75.3	414	426	451	87	89	94	97.4	91.8				
China (3) . . . . .	...	...	7,319	...	...	...	...	14,283	...	...	2,988	...	...		
Cyprus . . . . .	...	9	11	...	...	8	8	11	2	2	2	97.7	67.2	
Chosen	622	577	506	107.3	123.1	874	894	845	183	187	177	97.7	103.5				
India (4)	21,052	23,348	24,631	90.2	85.5	18,328	20,196	22,188	3,834	4,225	4,642	90.8	82.6				
do. (5) . . . . .	...	23,553	24,630	...	...	...	20,480	22,049	...	4,285	4,613	...	...		
Iraq . . . . .	...	79	45	...	...	...	64	29	...	13	6	...	...		
Japan . . . . .	...	2	2	...	...	...	4	3	...	9	7	...	...		
Syria	103	93	64	110.8	161.7	...	185	96	...	39	20	...	...		
Turkey . . . . .	...	680	565	...	...	...	1,462	1,030	...	306	215	...	...		
Belgian Congo . . . . .	...	980	752	...	...	...	772	615	...	161	129	...	...		
Egypt	1,687	1,852	1,848	91.1	91.3	8,677	8,260	8,871	1,815	1,728	1,856	105.0	97.8				
Kenya . . . . .	...	...	...	...	...	...	40	58	...	8	12	...	...		
Nigeria (6) . . . . .	...	...	...	...	...	...	...	(7) 156	...	...	(7) 33	...	...		
Nyasaland . . . . .	...	92	71	...	...	...	49	47	...	10	10	...	...		
Uganda	1,574	1,530	1,377	102.9	114.2	(8) 1,380	(8) 1,208	(8) 1,281	(8) 289	(8) 253	(8) 268	114.2	107.8				
Anglo-Eg. Sudan	427	458	402	93.1	106.2	1,104	1,258	1,077	231	263	225	87.7	102.4				
Tanganyika . . . . .	...	...	...	...	...	(9) 314	(8) 199	(8) 195	(9) 66	(8) 42	(8) 41	...	...		
Union of S Africa . . . . .	...	...	...	...	...	...	3	10	...	1	4	...	...		

(1) See *Summary of Cotton Reports*. — (2) Sown area. — (3) According to the Chinese Cotton Statistics Association, Shanghai. — (4) Fourth Report, covering the entire cotton area of India. — (5) Final estimates. That of last year is subject to revision. — (6) Northern Provinces. — (7) Cotton lint bought, American variety only. — (8) Exports. — (9) Quantities available for export.

Egypt: Land preparation for the cotton crop began in January, notably on large holdings. The weather conditions of the month were generally favourable for work. Sowing began only at the end of the month and on only a few areas in the provinces of Guirga, Qena and Aswan.

Cotton ginned up to the end of December, in bales of 478 lb. net weight was as follows:

Varieties	1940	1939	1938	1937	1936	1935	1934
Giza 7	407,488	290,784	385,803	344,273	222,257	142,982	84,294
Sakellariadis	35,363	37,654	72,200	92,626	151,949	145,590	186,801
Other varieties above:							
1 3/4"	76,175	75,747	82,731	80,321	80,587	43,521	82,641
1 1/4"	62,052	35,058	24,375	25,452	37,422	33,261	63,013
1 1/8"	822,246	780,158	966,895	1,069,799	953,237	835,848	912,059
Total	1,497,324	1,219,401	1,532,004	1,612,471	1,445,452	1,201,202	1,329,708
Scario	25,762	23,336	26,556	34,544	31,402	24,669	26,962
Total production (including Scario) *	1,815,221	1,728,090	2,281,223	1,887,164	1,768,581	1,565,583	1,776,908

* Second estimate.

Uganda: The early onset of hot and dry weather during the month of December has ripened the crop quickly and has favoured the picking of high grade cotton.

Union of South Africa: Owing to the substantial advance in price and large inquiries for lint from South African factories, a much larger acreage has been planted than for the past two seasons. The area of the 1939-40 season is estimated at between 5,000 and 6,000 acres against approximately 2,500 acres in 1938-39. Good planting rains were experienced and the crop at the end of December was progressing favourably.

CURRENT INFORMATION ON HEMP.

Area and Production of Hemp.

COUNTRIES	AREA					PRODUCTION				
	1939	1938	Average 1933 to 1937	% 1939		1939	1938	Average 1933 to 1937	% 1939	
				1938	Average				1938	Average
ooo acres			= 100	= 100	ooo lb.			= 100	= 100	
Fibre.										
Germany	1) 39	1) 32	2) 9	122.6	—	...	25,953	12,181	...	...
Bulgaria	23	25	16	93.4	146.3	14,483	9,062	7,098	159.8	204.0
France . . . . .	...	9	8	...	...	...	9,231	7,933	...	...
Italy	224	225	173	99.6	129.5	...	239,487	168,180	...	...
Poland . . . . .	...	83	82	...	...	...	28,306	24,976	...	...
Romania	143	126	119	113.5	119.8	...	66,790	57,155	...	...
Yugoslavia . . . . .	...	143	110	...	...	...	122,135	90,332	...	...
U.S.S.R.	5) 986	1,248	6) 1,467	79.0	67.2	...	...	7) 477,247	...	...
Japan . . . . .	...	17	15	...	...	...	19,847	16,890	...	...
Manchukuo . . . . .	...	89	49	...	...	...	38,422	16,094	...	...
Syria	21	12	8	174.0	273.3	...	7,637	4,962	...	...
Hempseed.										
Germany	1) 39	1) 32	2) 9	122.6	—	...	17,417	7,781	...	...
Bulgaria	23	25	16	93.4	146.3	8,459	4,870	4,855	173.7	174.2
France . . . . .	...	9	8	...	...	...	...	1,636	...	...
Italy	224	225	173	99.6	129.5	...	6,221	5,601	...	...
Poland . . . . .	...	83	82	...	...	...	43,292	40,185	...	...
Romania	143	126	119	113.5	119.8	...	54,536	45,819	...	...
Yugoslavia	—	—	—	—	—	...	6,597	5,433	...	...
Manchukuo . . . . .	...	121	4) 151	...	...	...	80,350	4) 95,124	...	...
Syria	21	12	8	174.0	273.3	...	1,368	1,133	...	...

(1) Including Ostmark and Sudetenland. — (2) Excluding the Sudetenland and Memel — (3) Excluding Ostmark. — (4) Average 1935 to 1937. — (5) Area provided for in the Plan. — (6) Average 1933 to 1935. — (7) Average 1933 and 1934.

Romania: As part of a general economic plan and in consideration of the difficulties of trading, the Ministry of Agriculture has taken steps to intensify the cultivation of textile plants this season. Adequate quantities of seed will be distributed to growers by the agricultural authorities, with facilities for payment.

CURRENT INFORMATION ON TOBACCO.

Union of South Africa: Good tobacco crops were expected at the beginning of the year in the southwest of Cape Province. In the Barberton district of Transvaal crops were slightly damaged by rain.

Area and Production of Tobacco.

COUNTRIES	AREA					PRODUCTION				
	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40		1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40	
				1938 and 1938- 1939 = 100	Aver- age = 100				1938 and 1938 1930 = 100	Aver- age = 100
ooo acres					ooo lb.					
Albania . . . . .	...	5	4	...	...	...	4,612	3,171	...	...
Germany (1) . . . .	...	33	31	...	...	...	73,855	72,297	...	...
Belgium	7	5	7	124.6	93.4	...	10,529	14,683	...	...
Bulgaria	105	77	82	137.5	128.4	77,933	57,095	66,476	136.5	117.2
France . . . . .	...	45	45	...	...	...	73,119	76,544	...	...
Greece	208	202	216	103.1	96.4	121,158	91,656	129,193	132.2	93.8
Hungary	2) 39	35	39	—	—	2) 48,852	3) 43,062	3) 47,045	—	—
Italy . . . . .	...	81	83	...	...	...	92,758	97,488	...	...
Poland . . . . .	...	20	13	...	...	...	32,203	21,818	...	...
Romania	53	43	35	125.0	152.2	...	27,207	22,291	...	...
Switzerland . . . .	...	1	1	...	...	...	3,042	2,289	...	...
Yugoslavia . . . . .	...	43	35	...	...	4) 40,786	32,425	27,097	125.8	150.5
—
U. S. S. R. . . . .	...	5) 504	490	...	...	...	...	6) 438,192	...	...
—
Canada	93	84	52	111.3	179.6	108,770	101,395	51,464	107.3	211.4
Cuba . . . . .	...	112	112	...	...	...	55,321	44,640	...	...
United States	1,942	1,600	1,529	121.3	127.1	1,769,639	1,376,471	1,293,626	128.6	136.8
Mexico . . . . .	...	52	39	...	...	...	41,723	29,975	...	...
—
Burma . . . . .	...	96	99	...	...	...	95,003	98,112	...	...
Chosen . . . . .	...	48	40	...	...	...	61,695	44,619	...	...
India 7) . . . . .	...	1,235	1,206	...	...	...	1,124,480	1,269,636	...	...
Japan	107	92	85	116.2	124.7	180,802	144,602	144,095	125.0	125.5
Manchukuo . . . . .	...	71	—	...	—	...	43,619	—	...	—
Palestine . . . . .	...	7	7	...	...	...	2,601	2,722	...	...
Syria and Lebanon . .	...	11	14	...	...	...	7,518	8,379	...	...
Transjordan	1	2	8) 2	61.1	65.3	294	1,920	883	15.3	33.3
Turkey . . . . .	...	208	167	...	...	...	117,267	110,141	...	...
—
Algeria . . . . .	...	58	54	...	...	...	42,007	39,406	...	...
Tunisia	1	1	1	106.1	80.8	...	850	1,335	...	...
—
Argentina . . . . .	...	45	36	...	...	...	40,490	29,711	...	...
—
Nyasaland 9) . . .	...	71	43	...	...	12,700	17,929	14,844	70.8	85.6
Union of S. Africa 10)	—	—	—	—	—	...	29,021	17,152	...	...
—
Australia . . . . .	...	8	11	...	...	...	3,922	4,840	...	...

(1) Former territory; production for sale. — (2) Present frontiers, excluding Sub-Carpathian Russia. — (3) Territory at the end of 1937. — (4) Unofficial estimate. — (5) According to the Plan. — (6) Average 1933, 1934 and 1936. — (7) Not including Burma. — (8) Year 1937. — (9) European and native plantations. — (10) European plantations only.

CURRENT INFORMATION ON OTHER PRODUCTS:

Cacao.

Gold Coast and British Togoland: MAIN CROP 1939-40. — The weather continued favourable for drying in all districts in December and rapid marketing continued in practically all districts. A slight increase in germinated beans and mould was reported from some districts and some wet cacao may have been rushed through while buying was at its maximum. On the other hand, certain districts reported that farmers were hand-picking poor quality lots so as to avoid marketing Grade III cacao. Quantities sold up to December 1 were estimated at 125 million lb. After deduction of the quota for December (134,000,000 lb.), there remained 301 million lb. to be marketed out of a total of 560 million lb. Individual shippers did not all exhaust all their quotas for December so that the amount marketed to date is somewhat less than that indicated. The total marketed in November-December of the previous year was 263 million lb.

The situation during the first three months of the year is summarized below. —

	Oct.	Nov	Dec	Total
		(million lb.)		
Stocks at end of month				
in the interior.	22	29	96	—
at ports	45	69	96	—
			—	—
Total . . .	67	98	192	—
		—	—	—
Entered at ports	34	65	81	179
Total exports (incl. overland)	22	40	54	116
Carryover	—	—	—	34
New crop exports	—	—	—	85

It was estimated that 91 per cent. of the crop was ripe, 79 per cent. had been harvested and 46 per cent. marketed; 33 per cent. remained in farmers' hands.

At a meeting of the Cocoa Crop Estimates Committee held in Accra on January 9, it was decided to make no change in the previous estimate.

MOVEMENT — Movement statistics for November are as follows —

Railway off-loadings, Takoradi	26.5	45.2
	December	December
	1939	1938
	(million lb.)	
Exports —		
Takoradi	16.7	28.4
Accra	30.0	46.7
Other ports	7.9	14.8
All ports	54.6	89.9
Eastern Frontier	0.1	2.2
Total exports . . .	54.7	92.1

Tea.

India. In North India the weather in November was cold and seasonable. Plucking was practically over. To the end of November there was an increase of 10,703,000 lb. on the corresponding outturn of the previous season. In South India the weather had settled down to typical northeast monsoon conditions with bright days and cold nights; crop prospects were moderate and outturn was 3.5 % ahead of the same date in the previous season.

Coffee.

Brazil: According to the Departamento Nacional do Café, stocks in all Brazilian ports on December 31, 1939 were 4,641,000 centals, comprising 3,208,000 centals in Santos, 838,000 centals in Rio de Janeiro and the remaining 595,000 in other ports.

Netherlands Guiana. Coffee crop prospects this season are generally good.

Nicaragua: The severe drought during most of the present coffee season has considerably damaged crops. The exportable crop this year is officially estimated at 265,000 centals, which is less than the actual exports of the last few years.

Dominican Republic: December weather was very favourable for coffee picking. The forecasts of a large crop this season are confirmed.

Venezuela: Coffee was being harvested in December with yields which were good to excellent and distinctly better than those of the previous year.

Belgian Congo. Coffee production in 1939 is officially estimated at 507,000 centals, against 478,000 in 1938. The total area of coffee plantations in 1939 is estimated at 166,000 acres, with 143,000 in production.

Nyasaland: The condition of coffee plantations in December was considered average.

Sierra Leone: December reports confirm that the current coffee crop is average.

New Caledonia. The flowering of *arabica* varieties was normal. Coffee production this season is estimated as excellent

Groundnuts.

United States: The production of groundnuts (picked and threshed) in 1939 is estimated at 1,179,505,000 lb. against 1,305,800,000 lb. in 1938 and an average of 1,090,815,000 lb. in 1933 to 1937; percentages, 90.3 and 108.1.

Uruguay: The groundnuts crop benefited greatly from rains in the first half of February in the principal producing centres.

Netherlands Indies: J a v a and M a d u r a. — The Department of Agricultural Statistics of the Central Statistical Office communicates the following details of the groundnut area —

	1939 ACRES	1938 ACRES
Area harvested in December	51,600	52,600
Area harvested from January 1 to December 31	589,100	640,700
Area of standing crops at the end of December .	148,300	159,100

Colza and Sesame.

Germany. According to the census of May 1939, only recently published, the area under colza was 96,200 acres, against 130,000 in 1938; percentage, 74.0.

Burma. According to the third estimate, area of sesame to mature this year is about 1,134,000 acres against the final estimate of 1,084,000 in 1938-39 and 1,031,035 on the average of the two years ending 1937-38; percentages, 104.6 and 110.0. The corresponding production is estimated at about 1,220,000 centals (61,000 short tons) against the final estimate of 1,187,000 (59,400) and 1,172,000 (58,600); percentages, 102.8 and 104.2.

CURRENT INFORMATION ON FODDER CROPS.

Germany: Final estimates of the area under fodder crops in 1939 have now been issued while some new figures are available for crops for which the 1932-37 averages are not available.

	1939	1938	Average 1932-37	1938 — 100	% 1939 Average — 100
	(thousand acres)				
Clover	4,186	4,621	4,918	90.6	85.1
Alfalfa	1,324	1,211	1,063	109.4	124.6
Permanent meadows . . .	16,960	17,125	17,174	99.0	98.8
Kohl-rabi	495	549	...	90.0	...
Mangels	2,339	2,266	...	103.2	...

Hungary. On February 6 it was forecast that fodder supplies would be barely sufficient for the winter. A shortage of hay is already reported in some areas.

United Kingdom. The grant of £2 per acre for ploughing up new land for cereal cultivation is extended by a new Agricultural Bill to the ploughing up and re-seeding of pastures, so as to carry more stock, subject to the approval in each case of the War Agricultural Executive Committees.

Egypt. The rains of January had excellent effects on the growth of clover but condition was still below average in Lower Egypt. Second cuts were being taken on early and general fields while in Middle Egypt the third cut was being taken on the early areas. Ploughing in of clover as green manure in preparation for cotton sowing was also begun.

LIVESTOCK AND DERIVATIVES

CATTLE AND PIG POPULATION IN DENMARK.*

Pigs.
(Thousands)

CLASSIFICATION	1939									1938		
	Dec 30	Nov 18	Oct 7	Aug 26	July 15	June 17	May 6	March 25	Feb. 11	Dec 31	Nov. 10	Oct. 8
Boars for breeding	17	17	18	18	18	17	18	18	18	17	16	16
Sows in farrow for first time . . .	80	63	62	65	76	82	111	119	109	82	67	54
Othersows in farrow	162	176	189	192	171	163	160	152	145	143	147	156
Sows in milk . . .	95	86	81	85	99	101	81	78	77	72	68	72
Sows not yet covered (and not for slaughter)	21	24	25	27	27	23	20	19	19	23	24	25
Sows for slaughter.	12	15	15	9	10	9	9	9	9	9	13	14
<i>Total sows</i>	<i>370</i>	<i>364</i>	<i>372</i>	<i>378</i>	<i>383</i>	<i>378</i>	<i>381</i>	<i>377</i>	<i>359</i>	<i>329</i>	<i>319</i>	<i>321</i>
Sucking pigs not weaned	804	735	696	731	841	862	684	652	648	603	581	642
Young and adult pigs for slaughter:												
Weaned pigs under 35 kg . . .	749	732	767	839	771	660	657	636	618	639	676	706
Pigs of 35 and under 60 kg. .	657	697	766	663	641	589	571	550	571	615	608	645
Fat pigs of 60 kg. and over .	537	685	573	535	473	491	443	491	505	503	561	516
<i>Total pigs . . .</i>	<i>3,134</i>	<i>3,230</i>	<i>3,192</i>	<i>3,164</i>	<i>3,127</i>	<i>2,997</i>	<i>2,754</i>	<i>2,724</i>	<i>2,719</i>	<i>2,706</i>	<i>2,761</i>	<i>2,846</i>

* Rural districts.

Cattle.
(Thousands).

CLASSIFICATION	30 December 1939	15 July 1939	31 December 1938	16 July 1938	31 December 1937	17 July 1937	2 January 1937	18 July 1936
Calves under 1 year . . .	850	854	832	834	791	764	798	785
Heifers 1 year and over .	587	653	557	610	544	603	538	580
Cows which have calved, 2 years and over . . .	1,618	1,604	1,625	1,599	1,590	1,573	1,601	1,610
Steers 1 year and over . .	64	79	70	80	79	80	70	68
Bulls 1 year and over . .	67	68	66	63	63	64	65	64
<i>Total cattle . . .</i>	<i>3,186</i>	<i>3,258</i>	<i>3,150</i>	<i>3,186</i>	<i>3,067</i>	<i>3,084</i>	<i>3,072</i>	<i>3,107</i>

**MILK UTILIZED BY DAIRY FACTORIES AND DAIRY PRODUCTION
IN THE NETHERLANDS ***

CLASSIFICATION	1939	1938	1937
		ooo lb.	
MILK USED FOR MANUFACTURING	7,818,566	7,430,051	7,527,092
BUTTER PRODUCED IN DAIRY FACTORIES	229,978	214,557	214,045
Butterfat content of above (est.)	193,181	180,229	179,799
CHEESE PRODUCED IN DAIRY FACTORIES:			
Full cream	23,157	20,792	21,649
Cheese containing 40 % or more of butter fat	139,153	138,967	133,806
" " 30 % " " " "	7,044	9,656	10,781
" " 20 % " " " "	35,733	37,953	38,473
" " under 20 % " " " "	692	875	780
Butterfat content of above (est.)	44,247	44,218	43,471
OTHER DAIRY PRODUCTS:			
Condensed whole milk	189,889	195,000	223,693
Condensed skimmed milk	125,419	150,045	156,022
Powdered cream	134	262	320
Powdered whole milk	34,602	31,125	30,166
Powdered partly skimmed milk	478	580	412
Powdered skimmed milk	46,888	30,386	30,309
Powdered butter milk	761	(1)	(1)
Powdered whey	2,055	(1)	(1)
Casein	4,544	5,291	5,386
incl. rennet casein	(990)	(2,030)	(1)
Butterfat content of above products (est.)	26,740	26,319	28,680

* The figures relate to 819 factories, this number does not include factories with a small output. — (1) Not available

PIGS IN SWITZERLAND.

The Federal Bureau of Statistics recently published a report on the numbers of pigs in Switzerland in November 1939.

The details of pig breeding reflect clearly the present economic conditions in regard to food supplies, price movements and fodder. A general numerical

census of pigs was not taken this autumn, owing to the preoccupation of the population and the authorities with mobilization. However, in order to have some information on the most important changes and tendencies of this branch of stock breeding, a partial inquiry was carried out, covering 350 communes in 21 Cantons.

In recent years the spread of foot-and-mouth disease has made it necessary to exclude certain countries and cantons from the annual livestock enumerations. It was consequently impossible to compare all the cantonal results on an equivalent basis and between different periods. It is necessary, therefore, to treat with reserve the results obtained. Nevertheless, the estimate of total numbers based on the results of the 350 communes included in the census may be considered as reasonably accurate. Comparisons of changes in the smaller cantons and in the categories and age groups, however, must be treated with great reserve.

On the basis of this partial census, the total number of pigs may be estimated at roughly 1,120,000. The increase compared with November 1936 and 1937 (in 1938 no enumeration was made), is larger than any probable error and may be considered as definite. The present number of pigs thus appears to have exceeded the number of 1,050,000, which, before the Great War, seemed sufficient for the requirements of the home market.

The large number of pigs is certainly useful as a reserve food supply but it requires a complete use of all available fodder and makes necessary measures to ensure feed supplies, which are already fairly heavily dependent on imports. The trend of future production cannot, however, be estimated only from the number of pigs in comparison with previous years, for possibly fodder supplies, in view of the fall in milk production and the decrease in the by-products of dairies and butter factories, will be smaller during the coming months, and the fattening of pigs will be less rapid than in previous years.

The fact that, in spite of the large number of pigs, the supply of fat pigs last autumn showed a temporary decline is due among other things to the difficult conditions since the opening of hostilities and especially to the fact that a comparatively small proportion of the total number was ready for slaughter. Thus, compared with the small number of young pigs returned in the census of the spring of 1930, the present number of pigs for fattening of six months or over, is not much above the average. Conservative estimates give a figure of 316,450. This total is slightly higher than in November 1936 and 1937 (279,000 and 300,300 respectively) but considerably smaller than the record figures of 1934 and 1935 (398,000 and 372,600). The limited number of pigs for fattening this autumn, the inadequacy of the information on the progress of pig breeding and the seasonal conditions were responsible for a rapid and considerable increase in prices during September and October. In addition, the present exceptional circumstances influence prices. Prices soon attained a level which did not correspond with the development of home production.

The category of young pigs shows the largest increase. The total may be put at 458,000, which approaches the record. The increase seems to be general. In the large producing areas of western Switzerland it corresponds roughly to the average of the country, while in eastern Switzerland it is lower.

The youngest category of pigs includes, compared with 1936 and 1937 about 10,000 more males. This increase is confined to weaned pigs. This surprising increase, however, is explained by the abolition of the quota. There is now no longer any inducement to class weaned pigs in the category of sucking pigs, since the latter no longer count in the calculation of the quota. The proportion of sucking pigs must in reality have been the same as in 1937.

The number of sows (83,200) is the same as in the autumn of 1936, while, compared with 1937, it has increased by 9,000. It has not, however, reached the level of 1934 and 1935. The present number may undergo further modifications. A characteristic of the present situation is that, compared with 1936 and 1937, there is a relatively large increase in sows with litter (29,200), while, the number of sows in farrow is slightly higher than in 1937 but lower than in 1936.

All these facts (relatively small increase in the number of young male pigs, considerable increase in the number of other young pigs and sows with litter) indicate that the tendency to increase pig breeding has reached its peak. The uncertainty of the future development of breeding and fattening of pigs, of their prices, costs and feeding has again caused recently a certain prudence among breeders. The immediate cause is the difficulty of marketing young pigs in a number of districts in the last few months. The number of boars has slightly increased, which also indicates more intensive breeding.

DAIRY PRODUCTION IN SWITZERLAND

The Swiss Dairy Commission has just issued the following provisional dairy statistics.

	1939	1938
<i>Milk herds</i>		
Milch cows (census) Number	926,400	912,516
Goats for milking (estimate) „	146,000	149,000
<i>Milk production</i>		
Cows (1939. 6,610 lb, 1938. 6,750 lb per year)	} thousand lb	6,268,000
Goats (1939 930 lb, 1938 950 lb per year)		
	6,305,000	
<i>Milk deliveries at central stations (Brugg estimates)</i>		
+ or — compared with the previous year	0.6 %	+ 3.6 %
<i>Utilization of milk</i>	thousand lb	
For feeding to livestock	1,100,000	1,040,000
For consumption in producers' households	840,000	840,000
For sale to other consumers	1,390,000	1,390,000
Exported	200	400
Imported	22,000	20,000
For processing (cheese, butter, condensed milk, etc)	2,960,000	3,100,000
<i>Dairy products obtained</i>		
Cheese of all kinds	113,000	116,000
Butter of all kinds	64,000	67,000
Condensed milk and powdered whole milk	22,000	20,000

The monthly enquiries of the Price Offices on deliveries to collecting centres cover about 30 per cent. of these centres and provide a good general idea on the commercial production of milk. In 1939, deliveries averaged 2.8 per cent.

below those of 1938. The serious spread of foot-and-mouth disease in the first quarter, the early start of dry feeding in the last quarter and the poor quality of fodder in general, together with the effects of mobilization were the causes of this drop in production.

Consumption in the homes of producers did not change but quantities fed to stock increased by about 60,000,000 lb. owing to the increase in the number of calves.

Total milk production in 1939, after allowing for exports, works out at 6,268 million lb. a decrease of 0.6 per cent. from 1938.

As the livestock enumerations showed an increase in cow-numbers of 1.5 per cent., it may be concluded that the annual yield per cow fell from 6,750 lb. to 6,610 lb. (2 per cent.), assuming that the average yield per goat was 930 lb.

The quantity used for manufacture in 1939 was 101 million lb. less than in the previous year. This is equivalent to a reduction of 3,300,000 lb. in cheese production and of 2,900,000 lb. in butter production. The production of powdered milk having increased, there was an increase in total production of preserved milk of 20,000,000 lb. to 22,000,000 lb.

Imports of milk products were greater in volume and value. There was a slight increase also in exports. The latter consist of packed cheese. Stocks of butter and cheese were not as large as in 1938 but holdings of the latter product are comparatively high.

NEW REGULATIONS FOR THE COMPULSORY DELIVERY OF WOOL TO THE STATE IN THE U. S. S. R.

By a Government Decree of January 30 new regulations were introduced for the compulsory consignment of wool to the State, which come into force during the present year.

According to the regulations hitherto in force, collective holdings (kolkhozi) had to deliver a certain quantity of sheeps' goat's, and camels' wool to the State, in proportion to the number of livestock on these holdings. Some time back the Government took a series of measures to intensify further the breeding of these animals on collective holdings and during the second half of 1939 44,070 special holdings for sheep and goat raising were instituted on these holdings throughout the Union. It is estimated that at the end of 1939 about 10 per cent. of the collective holdings of the Union were not engaged in sheep raising. Now all the collective holdings must, by the new regulations, consign wool to the State in proportion to the area cultivated, including also gardens, kitchen-gardens, meadows and pastures. The territory has been divided into 8 zones and the quantity of wool which must be consigned to the State varies for the present year from a minimum of 25 g. to a maximum of 604 g of semi-fine wool per hectare (2.2 lb. to 53.5 lb. per 100 acres). For 1941 the quota has been raised to from 40 to 700 g. (3.6 to 62.5 lb.). With these new measures the Government believes that it can secure more intensive raising of sheep and goats.

For collective holdings which are within a certain radius around the large towns and in which vegetable growing is developed, the former regulations remain in force, namely, the delivery of a certain quantity of wool proportionate to the number of stock.

For the private holdings of the members of the kolkhozi and for individual holdings the regulations remain in force requiring the compulsory delivery of wool to the State in proportion to the number of livestock. For these holdings also, the territory of the Union is divided into 8 zones and from 1940 onwards the quantity of wool required from the private holdings of the members of the kolkhozi varies from a minimum of 7 oz. to a maximum of 39 oz. (200 to 1,100 g.) per sheep and from 5 to 7 oz. (130 to 200 g.) per goat. For individual holdings the quantities are rather higher varying from 18 to 49 oz. (500 to 1,400 g.) per sheep and from 5 to 8 oz. (150 to 220 g.) per goat.

The terms of the delivery of wool were also fixed: 60 per cent. of the wool must be delivered not later than August 1, and the remainder not later than November 1.

A scale of the different qualities of wool has been fixed.

CURRENT INFORMATION ON LIVESTOCK AND DERIVATIVES.

Estonia Feeding conditions for dairy cows have been worse this winter than last, because fodder production was smaller. Consequently, milk production has declined.

Hungary On February 6 the condition of livestock was satisfactory.

Netherlands The situation having been fairly unfavourable during October, November and December, supplies of hay and fodder were limited. Compared with December last year, milk production during December 1939 was 15 per cent less in Drente, Suidholland, Zeeland, and Nordbrabant. In the Provinces this production was the same. In Overijssel it was 75 per cent. higher and in Limburg 5 per cent. higher. In Groningen and Utrecht it was 75 per cent. lower, in Gelderland 10 per cent., in Friesland 3 per cent., and in Nordholland 15 per cent. less.

Argentina The situation and health of livestock were generally very good throughout Argentina in January. Sheep shearing was making good progress and fleece yields varied from average to good.

Canada December was a very mild month throughout the whole of Canada, temperatures ranged well above normal and although cloudy and overcast skies reduced the amount of sunshine, precipitation was light and the snow fall was far below the average for this season. In the Eastern Provinces very little snow fell until after December 10, but by the end of the month most sections of the country had a good covering. In the west, the weather was exceptionally mild. Some rain occurred but there was practically no snow until Christmas. Reports from the Prairies showed the usual wide variations.

Favourable weather conditions and the light snow fall permitted cows to range in the open until well on in December and made it possible for farmers to haul from the open stacks and to hold larger supplies of grains and roughage for future use. On the whole supplies of feed on farms are abundant.

Dairy cattle were reported to be in good condition in most parts of the Dominion. The downward trend in milk production continued in November in the Maritimes, Alberta and British Columbia, but reports suggested that some improvement was in sight since better demand was likely to result in increased production.

Creamery butter production in 1939 was estimated to have reached 266,879,000 lb. against 266,887,000 lb. in 1938. Factory cheese production was estimated at 120,976,000 lb. against 121,315,000 lb.

United States: During the month of December milk production in the United States increased about as usual and on January 1, 1940, the quantity of milk produced on farms was some 2 per cent. higher than at the beginning of 1939. The total milk production at this date is a record but the supply per head of the population was only about 2 per cent. above the 1929-38 average for this date.

Moderate temperatures and little snow in the first three weeks of December were very favourable for milk production in the northern and central portions of the country. On the other hand the lack of moisture during the early part of the month reduced available pasturage in some of the Southern States. Feed supplies on farms are generally plentiful and prices of dairy products appear to have held up well at the turn of the year. In a limited number of the more important milk producing States for which monthly records are available, grain feeding on January 1 appears to have been unusually heavy for that season of the year.

Union of South Africa: The comparative failure of the wheat, barley and oats crops in the southwestern belt of Cape Province is expected to cause difficulties in feeding stock in that area in the next few months. Stock in December were still grazing on stubble and were in good condition. Cape Province and the greater part of Orange Free State generally experienced dry, hot weather in December and grazing deteriorated from drought in many areas, causing some preoccupation. Blowfly (*Calliphora*) was troublesome in many districts.

In Transvaal, Natal and the northeast of Orange Free State good rains fell in December and grazing generally was good. Locust swarms were prevalent in Transvaal and the Orange Free State.

The wool yield in the Orange Free State is satisfactory

CURRENT INFORMATION ON SERICULTURE.

Production of Fresh Cocoons.

COUNTRIES	QUANTITIES OF EGGS PREPARED FOR INCUBATION					PRODUCTION OF FRESH COCOONS								
	1939	1938	Average 1933 to 1937	% 1939		1939	1938	Average 1933 to 1937	% 1939					
				1938	Average				1938	Average				
											= 100	= 100	= 100	= 100
ooo oz					ooo lb.									
Bulgaria	...	38	28	...	...	1) 5,071	4,803	3,189	105.6	159.0		
France	...	11	15	...	...	...	1,320	1,717	...	...		
Greece	...	78	61	...	...	...	7,496	5,797	...	...		
Italy	...	343	439	...	...	1) 62,604	44,070	63,969	...	...		
Yugoslavia	...	14	20	...	...	...	1,059	1,207	...	...		
U. S. S. R.	...	...	...	...	...	...	51,368	39,130	...	...		
Cyprus	...	2	2	94.4	131.3	280	331	295	84.6	95.1				
Chosen	(s) 202	203	232	99.7	87.0	30,821	36,950	33,705	83.4	91.4				
	(t) 147	141	142	104.7	104.0	14,294	21,072	17,706	67.8	80.7				
Japan	(s) 2,069	2,069	2,536	100.0	81.6	369,733	337,832	379,441	109.4	97.4				
	(t) 2,502	2,450	2,987	102.1	83.8	339,690	284,339	346,806	119.5	97.9				
Syria and Lebanon	...	34	39	...	...	1) 4,409	3,318	2,818	132.0	156.5		

(s) Spring cocoons. — (t) Summer-autumn cocoons. — (1) Unofficial data.

TRADE

COUNTRIES	DECEMBER				FIVE MONTHS (August 1-December 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Wheat. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Bulgaria	477	0	0	0	1,765	0	0	0	2,097	0
Hungary	2,142	311	0	0	13,714	7,811	0	0	16,316	0
Lithuania	—	108	—	0	—	247	—	0	590	0
Poland-Danzig	—	65	—	0	—	256	—	65	734	65
Romania	2,756	2,353	0	0	9,998	12,381	—	0	27,571	0
Yugoslavia	789	157	0	0	3,909	2,421	0	0	87,746	0
U. S. S. R.	—	1,506	—	0	—	18,913	—	0	18,913	(7) 0
Canada	20,648	9,590	—	73	58,686	48,689	—	548	87,746	935
United States	358	2,658	244	300	7,310	15,486	2,447	2,133	46,050	6,134
Argentina	10,312	2,300	—	—	46,328	12,169	—	—	69,975	—
Chile	—	0	—	2 (2)	1	0 (2)	0	4	0	4
Uruguay	65	151	0	0	1,137	436	0	3	2,232	9
India: by sea	12	23	1	362	96	1,924	234	1,642	1,984	4,421
.. : by land	—	30	—	15 (4)	62	209 (4)	8	71	421	132
Iraq	—	47	—	0	—	426	—	0	621	0
Iran	—	0	—	0 (2)	0	0 (2)	0	0	0	0
Manchukuo	—	0	—	0 (3)	0	0 (3)	3	4	0	16
Syria and Lebanon	—	29	—	0	—	109	—	178	813	197
Turkey	0	79	—	—	51	633	—	—	1,098	—
Algeria	—	131	—	65	—	615	—	543 (5)	1,346	(5) 943
Egypt	—	0	—	0 (1)	1	1 (1)	20	0	1	60
French Morocco	—	233	—	0	—	1,468	—	0	2,460	(5) 1
Tunisia	—	111	—	1 (3)	48	396 (3)	5	7	2,273	88
Australia	—	2,503	—	0 (2)	3,549	10,882 (2)	0	0	36,429	0
<i>Importing Countries:</i>										
Germany (8) (9)	—	0	—	2,456	—	0	—	15,271	1	21,002
Austria (8)	—	0	—	590	—	2	—	1,959	(6) 3	(6) 3,064
Belgo-Luxemb. U. E.	—	970	—	1,501 (1)	138	1,512 (1)	9,457	11,168	2,219	24,891
Bohemia-Moravia (Protectorate) (10)	—	80	—	0	—	84	—	390	498	517
Denmark	0	0	235	164	29	38	1,126	1,306	40	2,364
Spain	—	—	—	—	—	—	—	—	—	—
Estonia	—	0	—	0 (4)	0	0 (4)	0	11	0	11
Finland	—	0	—	13 (4)	0	0 (4)	20	440	0	668
France	—	901	—	940	—	1,524	—	4,316	8,347	9,875
Greece	0	0	380	503	0	0	3,006	2,715	0	7,740
Ireland	—	0	—	1,181 (4)	0	0 (4)	621	4,400	0	10,084
Italy	—	2	—	658	—	28	—	2,451	85	10,112
Latvia	—	0	—	185	—	0	—	295	0	295
Norway	0	0	1,344	255	0	0	3,317	1,750	0	4,002
Netherlands	0	1	1,003	1,316	2	15	5,986	7,020	21	15,623
Portugal	—	0	—	657 (2)	0	0 (2)	52	1,101	0	1,295
United Kingdom	—	75	—	8,568	—	780	—	50,647	1,447	130,242
Sweden	—	6	—	96 (3)	2	11 (3)	230	704	189	1,169
Switzerland	0	0	1,372	1,098	0	0	5,715	4,950	0	10,260
Mexico	—	0	—	17	(3) 0	0 (3)	11	130	0	1,243
Brazil	—	—	—	1,995	—	—	(2) 4,863	9,500	—	23,148
Colombia	—	—	—	26	—	—	—	156	(5) 455	—
Peru	—	0	—	238 (2)	0	0 (2)	898	1,141	0	2,625
Burma	0	1	4	7	5	2	32	40	7	68
Ceylon	—	—	16	1	—	—	48	32	—	91
China	14	22	0	0	157	120	700	0	511	9,597
Chosen	—	0	—	0 (2)	0	0 (2)	0	22	0	86
Taiwan	—	—	—	0	—	—	(3) 3	0	—	14
Indochina	—	0	—	0 (1)	0	0 (1)	1	2	0	7
Japan	—	—	—	55	—	—	(3) 78	233	—	679
British Malaya	—	0	—	1 (2)	1	1 (2)	7	6	4	16
Palestine	0	—	74	179	0	0	305	420	0	1,791
Union of South Africa	—	0	—	3 (2)	0	0 (2)	103	1,025	0	1,030
New Zealand	—	0	—	79 (1)	0	0 (1)	207	400	0	2,006
Totals	—	24,443	—	23,600	—	139,589	—	129,259	336,275	309,075

(1) Up to November 30 — (2) Up to October 31. — (3) Up to September 30. — (4) Up to August 31. — (5) Up to June 30 — (6) Up to March 31. — (7) Up to December 31, 1938 — (8) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria. — (9) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (10) Up to March 15, 1939 the data refer to Czechoslovakia.

COUNTRIES	DECEMBER				FIVE MONTHS (August 1-December 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Wheat Flour. — Thousand cents (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Bohemia-Moravia (Protectorate) (8)	...	78	...	2	...	79	...	2	579	6
Bulgaria	0	0	0	0	2	2	0	0	3	0
Spain	...	...	...	...	...	...	...	...	...	...
France	...	349	...	62	...	947	...	375	4,246	859
Hungary	440	147	0	0	996	407	0	0	1,027	0
Italy	...	186	...	0	...	826	...	242	1,780	287
Latvia	...	0	...	0	...	0	...	0	0	0
Lithuania	...	0	...	0	...	11	...	0	30	0
Poland - Danzig	...	73	...	0	...	395	...	0	846	0
Romania	0	1	0	0	1	2	0	0	2	0
Yugoslavia	0	1	0	0	17	20	0	0	32	0
U. S. S. R.	...	68	...	0	...	712	...	15	(7) 712	(7) 15
Canada	1,769	716	...	10	3,322	3,876	...	69	9,024	145
United States	787	1,059	2	6	5,719	4,519	95	81	14,057	160
Argentina	165	148	...	...	932	804	...	...	2,048	...
Uruguay	61	15	0	0	209	175	0	0	385	0
Chosen	...	55	...	0	(2) 89	292	(2) 0	0	523	0
India: by sea	84	121	0	0	601	604	1	1	1,172	4
Iraq	...	11	...	0	...	75	...	0	153	0
Iran	...	0	...	0	(2) 0	0	(2) 0	0	0	0
Japan	...	353	...	0	(3) 1,340	2,749	(3) 16	0	4,594	0
Turkey	0	17	...	...	1	35	...	...	75	...
Algeria	...	28	...	14	...	226	...	78	(5) 455	(5) 114
French Morocco	...	0	...	0	...	0	...	0	(5) 0	(5) 0
Tunisia	...	26	...	2	(3) 26	156	(3) 1	51	384	119
Australia	...	855	...	0	(2) 3,338	5,527	(2) 0	0	14,767	0
<i>Importing Countries:</i>										
Germany (9) (10)	...	1	...	51	...	6	...	80	174	1,113
Austria (9)	...	0	...	69	...	1	...	119	(6) 2	(6) 268
Belgo-Luxemb. E. U.	...	4	...	2	(1) 15	35	(1) 52	9	95	40
Denmark	0	...	3	19	19	15	95	237	33	540
Estonia	...	0	...	0	(4) 0	0	(4) 0	0	0	0
Finland	...	0	...	26	(4) 0	0	(4) 48	287	0	501
Greece	0	0	11	4	0	0	21	16	0	43
Ireland	...	0	...	6	(4) 0	0	(4) 5	49	0	121
Norway	...	0	296	104	1	4	545	493	6	820
Netherlands	0	1	271	125	4	2	873	602	5	1,829
Portugal	...	0	...	5	(2) 0	0	(2) 9	22	0	38
United Kingdom	...	187	...	719	...	1,184	...	3,605	2,269	8,883
Sweden	...	1	...	2	(3) 4	2	(3) 2	4	8	8
Haiti	...	...	...	16	...	...	(1) 66	69	...	177
Mexico	...	0	...	0	(3) 0	0	(3) 1	1	0	2
Brazil	...	...	...	27	...	...	(2) 241	423	...	822
Chile	...	0	...	8	(2) 0	0	(2) 20	43	2	93
Colombia	...	...	...	2	...	...	...	10	...	24
Peru	...	0	...	4	(2) 0	0	(2) 9	18	0	42
Burma	0	0	62	62	0	0	322	277	1	865
Ceylon	...	...	36	32	...	...	233	172	...	366
China	29	129	230	173	481	161	3,059	2,291	1,176	7,108
Formosa	...	0	...	0	(1) 2	0	(1) 0	0	8	0
Netherlands Indies:	...	...	...	...	...	...	...	...	...	...
Java and Madura	...	...	...	165	...	...	(1) 459	579	...	1,271
Outer Provinces	...	...	...	80	...	...	(1) 315	331	...	746
Indochina	...	0	...	78	(1) 0	0	(1) 105	276	4	719
British Malaya	...	12	...	130	(2) 44	59	(2) 398	618	134	1,535
Manchukuo	...	0	...	871	(3) 0	0	(3) 2,560	3,095	0	5,592
Palestine	0	...	137	50	0	0	308	185	0	415
Syria and Lebanon	...	0	...	11	...	15	...	39	126	111
Egypt	...	0	...	3	(1) 1	0	(1) 15	16	0	46
Union of South Africa	...	0	...	1	(2) 1	1	(2) 3	4	2	9
New Zealand	...	0	...	0	(1) 0	0	(1) 0	0	0	1
Totals	...	4,645	...	2,941	...	23,924	...	14,884	60,939	35,857

(1) Up to November 30. — (2) Up to October 31. — (3) Up to September 30 — (4) Up to August 31 — (5) Up to June 30. — (6) Up to March 31. — (7) Up to December 31, 1938. — (8) Up to March 15, 1939 the data refer to Czecho Slovakia. — (9) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria — (10) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel, they do not include trade between these territories and the Protectorate of Bohemia-Moravia.

COUNTRIES	DECEMBER				FIVE MONTHS (August 1-December 31)				TWELVE MONTHS (August 1-July 31)	
	NET EXPORTS *		NET IMPORTS **		NET EXPORTS *		NET IMPORTS **		NET EX. *	NET IM. **
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Total Wheat and Flour †. — Thousand centals (1 cental = 100 lb.)										
Germany (8) (9)	—	—	—	2,523	—	—	—	15,370	—	22,254
Austria (8)	—	—	—	682	—	—	—	2,114	—	3,417
Belgo Luxemb. E. U.	—	—	—	528	—	—	(1) 9,368	9,620	—	22,599
Bohemia-Moravia: (Protectorate) (10)	—	—	—	—	—	—	—	205	746	—
Bulgaria	477	0	—	—	1,767	3	—	—	2,101	—
Denmark	—	—	239	184	—	—	1,199	1,565	—	3,000
Spain	—	—	—	—	—	—	—	—	—	—
Estonia	—	—	—	0	—	—	(4) 0	11	—	12
Finland	—	—	—	49	—	—	(4) 84	822	—	1,335
France	—	343	—	—	—	—	—	2,029	2,988	—
Greece	—	—	394	508	—	—	3,033	2,736	—	7,797
Hungary	2,796	507	—	—	15,042	8,354	—	—	17,685	—
Ireland	—	—	—	1,189	—	—	(4) 627	4,465	—	10,245
Italy	—	—	—	408	—	—	—	1,643	—	8,037
Latvia	—	—	—	185	—	—	(1) 0	295	—	295
Lithuania	—	108	—	—	(4) 0	262	—	—	630	—
Norway	—	—	1,739	393	—	—	—	4,042	2,403	5,087
Netherlands	—	—	1,364	1,481	—	—	—	7,144	7,804	18,034
Poland-Danzig	—	163	—	—	—	718	—	—	1,797	—
Portugal	—	—	—	663	—	—	(2) 64	1,189	—	1,345
Romania	2,750	2,353	—	—	9,999	12,384	—	—	27,574	—
United Kingdom	—	—	—	9,203	—	—	(1) 12,559	53,096	—	137,321
Sweden	—	—	—	91	—	—	(3) 224	696	—	980
Switzerland (11)	—	—	1,372	1,098	—	—	5,715	4,950	—	10,259
Yugoslavia	789	158	—	—	3,932	2,447	—	—	3,276	—
Totals Europe	—	3,812	—	19,185	—	24,168	—	111,031	56,797	252,017
U. S. S. R.	—	1,597	—	—	—	19,842	—	—	(7) 17,842	—
Canada	23,007	10,457	—	—	65,783	53,216	—	—	98,650	—
United States	1,162	3,763	—	—	12,362	19,268	—	—	78,447	—
Haiti	—	—	—	21	—	—	(1) 88	91	—	236
Mexico	—	—	—	17	—	—	(1) 12	131	—	1,246
Argentina	10,532	2,497	—	—	47,570	13,241	—	—	72,705	—
Brazil	—	—	—	2,031	—	—	(2) 5,184	10,062	—	24,244
Chile	—	—	—	13	—	—	(2) 26	61	—	126
Colombia	—	—	—	29	—	—	—	169	—	(5) 487
Peru	—	—	—	243	—	—	(2) 911	1,166	—	2,681
Uruguay	138	170	—	—	1,416	667	—	—	2,736	—
Burma	—	—	87	88	—	—	455	407	—	1,212
Ceylon	—	—	64	44	—	—	358	261	—	579
China	—	—	304	37	—	—	3,982	2,720	—	16,996
Chosen	—	73	—	—	(2) 219	368	—	—	612	—
Taiwan	—	—	—	0	—	—	(4) 0	0	—	3
India: by sea	122	—	—	177	662	1,086	—	—	—	881
: by land	—	15	—	—	(1) 54	138	—	—	311	—
Netherlands Indies.	—	—	—	—	—	—	—	—	—	—
Java and Madura	—	—	—	270	—	—	(1) 612	772	—	1,695
Outer Provinces	—	—	—	107	—	—	(1) 420	441	—	994
Indochina	—	—	—	104	—	—	(1) 140	370	—	960
Iraq	—	61	—	—	—	525	—	—	825	—
Iran	—	—	—	0	—	—	(2) 0	0	—	0
Japan	—	415	—	—	(3) 1,687	3,432	—	—	5,445	—
British Malaya	—	—	—	159	—	—	(2) 478	751	—	1,881
Manchukuo	—	—	—	1,161	—	—	(3) 3,417	4,130	—	7,472
Palestine	—	—	257	246	—	—	—	667	—	2,345
Syria and Lebanon	—	15	—	—	(4) 13	—	—	101	—	636
Turkey	0	102	—	—	52	—	679	—	1,198	—
Algeria	—	86	—	—	—	269	—	—	(5) 858	—
Egypt	—	—	—	4	—	—	(1) 39	21	—	119
French Morocco	—	233	—	—	—	1,468	—	—	(5) 2,459	—
Tunisia	—	142	—	—	(1) 76	529	—	—	2,537	—
Union of South Africa	—	—	—	4	—	—	(2) 104	1,029	—	1,040
Australia	—	3,643	—	—	(2) 8,000	18,252	—	—	56,118	—
New Zealand	—	—	—	79	—	—	(3) 207	400	—	2,007
Totals	—	27,081	—	23,969	—	156,584	—	134,763	380,295	319,102

* Excess of exports over imports. — ** Excess of imports over exports.

† Flour reduced to grain on the basis of the coefficient: 1,000 centals of flour = 1,333.333 centals of grain.

(1) Up to November 30 — (2) Up to October 31 — (3) Up to September 30 — (4) Up to August 31. — (5) Up to June 30. — (6) Up to March 31. — (7) Up to December 31, 1938 — (8) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria — (9) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel, they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (10) Up to March 15, 1939 the data refer to Czecho-Slovakia. — (11) Wheat only.

COUNTRIES	DECEMBER				FIVE MONTHS (August 1-December 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Rye. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries.</i>										
Bulgaria	0	0	0	0	0	0	0	0	0	0
Spain	—	—	—	—	—	—	—	—	—	—
Hungary	56	4	0	0	266	153	0	0	309	0
Latvia . . . . .	..	0	..	0	..	0	..	0	142	0
Lithuania . . . . .	...	207	...	0	..	815	..	1	1,383	1
Poland-Danzig . . .	—	1,200	—	0	..	2,205	..	0	8,272	0
Romania	107	46	0	0	614	35	0	0	640	0
Yugoslavia	0	0	0	0	0	0	0	0	0	0
U. S. S. R. . . . .	...	789	...	0	...	3,424	...	0	(6) 3,424	(6) 0
Canada	393	0	..	0	1,634	469	..	0	984	0
United States . . .	48	0	0	0	48	374	0	0	374	0
Argentina	829	19	—	—	2,290	58	—	—	2,064	—
Turkey	0	7	—	—	26	11	—	—	177	—
Algeria . . . . .	...	12	...	0	...	22	..	0	(4) 36	(4) 0
<i>Importing Countries.</i>										
Germany (7) (8) . .	..	0	...	753	..	1	..	1162	45	3,218
Austria (7) . . .	..	0	...	4	..	2	..	96	(5) 3	(5) 110
Belgo-Luxemb E.U.	...	7	...	1,104	(1) 0	17	(1) 976	2,861	32	6,863
Bohemia-Moravia (Protectorate) (9) .	..	0	...	0	...	0	...	524	110	532
Denmark	0	0	194	300	0	1	851	975	1	2,061
Estonia . . . . .	...	0	..	64	(3) 29	120	(3) 0	182	218	182
Finland . . . . .	...	0	...	9	(3) 0	0	(3) 24	249	0	329
France . . . . .	...	0	..	1	..	0	..	10	0	32
Greece	0	0	0	0	0	0	0	0	0	0
Italy . . . . .	...	0	...	164	..	0	..	372	0	1,379
Norway	0	0	475	300	0	0	1,725	1,387	0	2,734
Netherlands	0	291	4	40	1	645	198	305	976	1,649
United Kingdom . .	...	0	...	18	...	2	..	80	2	113
Sweden . . . . .	...	0	...	4	(2) 0	0	(2) 8	65	1	99
Switzerland	0	0	12	48	0	0	70	230	0	289
Palestine	—	—	17	12	—	—	147	71	—	188
Totals	—	2,542	—	2,821	—	8,354	—	8,570	19,193	19,779

(1) Up to November 30. — (2) Up to September 30 — (3) Up to August 31. — (4) Up to June 30 — (5) Up to March 31. — (6) Up to December 31, 1938. — (7) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria. — (8) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel, they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (9) Up to March 15, 1939 the data refer to Czechoslovakia.

COUNTRIES	DECEMBER				FIVE MONTHS (August 1-December 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Barley. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Bohemia-Moravia (Protector.) (8) . .	...	162	...	0	...	563	...	0	1,260	60
Bulgaria	0	0	0	0	0	0	0	0	0	0
Denmark	52	353	0	0	292	1,370	12	9	3,002	21
Spain	—	—	—	—	—	—	—	—	—	—
Hungary	34	16	0	0	115	48	0	0	107	0
Latvia . . . . .	...	0	...	0	...	0	...	0	97	0
Lithuania . . . . .	...	7	...	0	...	80	...	0	318	0
Poland - Danzig . .	—	995	—	0	...	2,364	...	0	5,846	0
Romania	107	269	0	0	2,327	2,362	0	0	4,195	0
Sweden . . . . .	...	0	...	0	(3) 0	0	(3) 0	0	2	0
Yugoslavia	0	0	0	0	3	0	9	8	1	21
U. S. S. R. . . . .	...	4	...	0	...	7,039	...	(7) 7,039	(7) 0	0
Canada	1,351	543	...	0	5,193	5,051	...	1	7,919	1
United States . . .	150	310	15	0	1,240	3,744	136	0	5,041	237
Argentina	491	88	—	—	1,375	315	—	—	4,644	—
Chile . . . . .	...	29	—	—	(2) 53	310	—	—	1,076	—
India: by sea . . .	2	1	71	1	4	34	196	20	39	79
Iraq . . . . .	...	421	...	0	...	1,819	...	0	4,573	0
Iran . . . . .	...	4	...	0	(2) 53	26	(2) 0	0	97	0
Manchukuo . . . .	...	0	—	—	(3) 0	1	—	—	5	—
Syria and Lebanon .	...	105	—	3	...	502	...	4	1,019	17
Turkey	0	106	—	—	156	1,415	—	—	2,740	—
Algeria . . . . .	...	3	...	35	...	159	...	54	(5) 254	(5) 199
Egypt . . . . .	...	1	...	2	(1) 0	62	(1) 0	7	68	19
French Morocco . .	...	283	...	0	...	731	...	0	(5) 1,649	(5) 0
Union of South Afr.	...	0	...	0	(2) 0	0	(2) 0	0	1	0
Australia . . . . .	...	39	...	0	(2) 245	111	(2) 0	0	1,545	0
<i>Importing Countries:</i>										
Germany (9) (10) .	...	0	...	977	...	0	...	4,490	1	9,208
Austria (9) . . .	...	0	...	124	...	0	...	480	(6) 0	(6) 713
Belgo-Luxemb. E. U.	...	21	...	1,159	(1) 7	129	(1) 2,357	5,346	217	10,406
Estonia . . . . .	...	0	...	0	(4) 0	0	(4) 0	0	0	4
Finland . . . . .	...	0	...	0	(4) 0	0	(4) 0	0	0	0
France . . . . .	...	6	...	66	...	10	...	691	62	1,54
Greece	0	0	6	76	0	0	42	172	0	34
Ireland . . . . .	...	0	...	180	(4) 0	0	(4) 0	241	0	51
Italy . . . . .	...	3	...	138	...	11	...	271	34	96
Norway	0	0	85	24	0	0	307	179	0	41
Netherlands . . .	0	136	32	258	2	549	944	2,372	848	4,85
United Kingdom . .	...	0	...	1,352	...	2	...	11,867	4	21,21
Switzerland	0	0	417	236	0	0	1,706	1,587	0	3,44
Mexico . . . . .	...	0	...	17	(3) 0	0	(3) 22	67	0	14
Burma	—	—	0	0	—	—	2	2	—	—
Ceylon	—	—	1	1	—	—	3	6	—	1
Chosen . . . . .	...	0	...	0	(2) 0	0	(2) 0	0	0	—
Indochina . . . . .	...	0	...	0	(7) 0	0	(1) 0	0	0	—
Japan	—	—	...	0	—	—	(3) 0	0	—	—
Palestine	0	0	0	31	0	0	19	157	6	30
Tunisia . . . . .	...	0	...	2	(3) 218	2	(3) 4	125	220	14
New Zealand . . . .	...	0	...	0	(5) 0	0	(5) 53	8	0	197
Totals	—	3,905	—	4,682	—	28,809	—	28,164	53,929	55,091

(1) Up to November 30 — (2) Up to October 31. — (3) Up to September 30 — (4) Up to August 31. — (5) Up to July 31 — (6) Up to March 31. — (7) Up to December 31, 1938. — (8) Up to March 15, 1939, the data refer to Czechoslovakia. — (9) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria. — (10) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia.

COUNTRIES	DECEMBER				FIVE MONTHS (August 1-December 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Oats. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Bohemia-Moravia (Protectorate) (8) .	...	111	...	0	...	121	...	0	582	2
Bulgaria	0	0	0	0	0	0	0	0	0	0
Hungary	0	0	0	0	0	0	0	0	0	0
Lithuania . . . . .	...	121	...	0	...	224	...	0	604	0
Poland-Danzig . . .	—	43	—	0	...	43	...	0	577	0
Romania	0	0	0	0	0	0	0	0	0	0
Yugoslavia	0	0	0	0	0	0	0	0	0	0
U. S. S. R. . . . .	...	0	...	0	...	14	...	0	(7) 14	(7) 0
Canada	797	358	...	0	2,253	1,399	...	782	3,265	1,134
United States . . .	4	16	260	0	17	1,058	947	1	1,193	427
Argentina	1,276	398	—	—	3,777	1,963	—	—	5,957	—
Chile . . . . .	...	142	—	—	(2) 185	287	—	—	1,119	0
Chosen . . . . .	...	0	...	0	(2) 0	0	(2) 0	0	1	0
India: by sea . . .	2	2	—	—	6	11	—	—	22	—
Turkey	0	0	—	—	6	127	—	—	231	—
French Morocco . .	...	43	...	0	...	327	...	0	(5) 486	(5) 0
Tunisia . . . . .	...	9	...	0	(1) 56	65	(3) 0	0	187	0
Union of South Afr.	...	1	...	0	(2) 3	2	(2) 0	0	5	2
Australia . . . . .	...	2	...	0	(2) 25	15	(2) 0	0	41	3
New Zealand . . .	...	0	...	0	(3) 0	0	(3) 2	2	4	5
<i>Importing Countries:</i>										
Germany (9) (10) .	...	0	...	154	...	0	...	1,126	1	1,725
Austria (9) . . .	...	0	...	4	...	0	...	205	(6) 0	(6) 620
Belgo-Luxemb. E. U.	...	0	...	28	(1) 0	1	(1) 41	119	1	655
Denmark	0	39	0	4	1	79	0	99	184	101
Estonia . . . . .	...	0	...	0	(1) 0	0	(4) 0	0	0	3
Finland . . . . .	...	0	...	0	(4) 0	0	(4) 3	20	0	20
France . . . . .	...	0	...	17	...	6	...	132	12	307
Greece	0	0	0	0	0	0	165	0	0	0
Ireland . . . . .	...	0	...	0	(4) 0	0	(4) 0	0	3	0
Italy . . . . .	...	0	...	19	...	5	...	25	5	153
Latvia . . . . .	...	1	...	0	...	1	...	0	238	1
Norway	0	0	46	0	0	0	49	0	0	2
Netherlands . . .	0	75	18	50	0	107	486	404	379	1,221
United Kingdom . .	...	2	...	150	...	4	...	893	27	2,073
Sweden . . . . .	...	0	...	0	(3) 0	0	(3) 19	26	47	40
Switzerland	0	0	716	284	0	0	1,860	1,415	0	4,977
Mexico . . . . .	...	0	...	0	(3) 0	0	(3) 1	20	0	25
Peru	—	—	...	1	—	—	(2) 8	11	—	26
Ceylon	—	—	0	2	—	—	6	7	—	17
Indochina . . . . .	...	0	...	0	(1) 0	0	(1) 0	0	0	0
Japan	—	—	...	0	—	—	(3) 0	0	—	0
Syria and Lebanon .	...	0	...	0	...	2	...	2	3	2
Algeria . . . . .	...	6	...	43	...	10	...	367	(5) 15	(5) 467
Egypt	—	—	...	0	—	—	(1) 0	0	—	1
Totals	—	1,369	—	756	—	5,871	—	5,656	15,203	14,009

(1) Up to November 30 — (2) Up to October 31. — (3) Up to September 30 — (4) Up to August 31 — (5) Up to June 30. — (6) Up to March 31. — (7) Up to December 31, 1938 — (8) Up to March 15, 1939, the data refer to Czechoslovakia. — (9) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria. — (10) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel, they do not include trade between these territories and the Protectorate of Bohemia-Moravia.

COUNTRIES	DECEMBER				TWO MONTHS (November 1-December 31)				TWELVE MONTHS (Nov. 1-Oct. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Maize. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Bulgaria	11	0	0	0	11	0	0	0	22	0
Hungary	0	0	0	0	0	0	0	0	1,038	0
Romania	1,356	1,465	0	0	1,740	2,592	0	0	12,014	0
Yugoslavia	0	188	0	0	2	289	0	0	2,334	0
U. S. S. R.	528	—	—	0	—	836	—	0	836	(7) 0
United States	2,956	2,067	30	25	3,631	5,428	67	45	19,673	253
Haiti	—	0	—	—	(1) 0	1	—	—	8	—
Dominican Republic	—	38	—	—	(1) 7	69	—	—	340	—
Argentina	4,044	5,369	—	—	7,860	12,488	—	—	74,809	1
Brazil	—	207	—	—	—	333	—	—	1,658	—
Burma	6	9	—	—	8	13	—	—	397	—
China	0	4	—	—	0	19	—	—	26	—
India: by sea	0	0	—	—	0	0	—	—	1	—
Netherlands Indies:										
Java and Madura	—	57	—	—	(1) 4	66	—	—	1,353	—
Outer Provinces	—	9	—	—	(1) 2	52	—	—	813	—
Indochina	—	1,337	—	—	(1) 1,511	2,880	—	—	10,037	—
Iraq	—	0	—	—	—	0	—	—	(1) 2	—
Manchukuo	—	540	—	—	—	915	—	—	(2) 6,311	—
Syria and Lebanon	—	4	—	0	—	4	—	0	(3) 76	(3) 9
Egypt	—	0	—	0	(1) 0	1	(1) 0	0	0	1
Madagascar	—	11	—	0	—	19	—	0	(4) 627	(1) 0
French Morocco	—	0	—	0	—	0	—	0	(5) 46	(5) 0
Union of South Afr.	—	521	—	2	(1) 1,534	1,229	—	4	12,752	10
<i>Importing Countries:</i>										
Germany (8) (9)	{	0	{	767	{	0	{	2,393	(4) 0	(1) 7,531
Austria (8)	{	0	{	815	{	0	{	1,261	(6) 0	(6) 2,364
Belgo-Luxemb. E. U.	44	—	1,003	—	89	—	2,060	345	12,188	—
Bohemia-Moravia (Protectorate) (10)	0	—	315	(1) 0	0	(1) 1,541	390	(4) 0	(4) 966	
Denmark	0	0	223	33	0	0	436	151	1	2,853
Spain	—	—	—	—	—	—	—	—	—	—
Estonia	—	0	—	0	—	0	—	0	(3) 0	(3) 1
Finland	—	0	—	244	—	0	—	503	(3) 0	(3) 619
France	—	2	—	1,649	—	2	—	3,617	(4) 14	(4) 10,663
Greece	0	0	14	126	0	0	14	245	0	1,336
Ireland	—	0	—	752	—	0	—	1,478	(3) 0	(3) 7,908
Italy	—	4	—	149	—	4	—	264	(1) 34	(4) 1,637
Latvia	—	0	—	0	—	0	—	0	(3) 0	(3) 0
Norway	0	0	278	225	0	0	724	413	0	2,647
Netherlands	0	0	1,634	1,446	0	0	3,234	3,127	2	15,968
Poland-Danzig	—	0	—	—	—	0	—	—	(4) 0	(4) 0
Portugal	—	0	—	88	—	0	—	296	0	864
United Kingdom	171	—	5,165	—	468	—	11,540	(3) 2,606	(3) 51,766	
Sweden	0	—	59	—	0	—	140	(2) 0	(2) 967	
Switzerland	0	0	318	297	0	0	673	442	0	2,385
Canada	0	—	—	1,070	0	—	—	1,844	3	(4) 3,053
Mexico	—	0	—	0	—	0	—	0	0	536
Peru	—	0	—	0	—	0	—	0	0	0
Chosen	—	2	—	0	—	4	—	—	0	488
Japan	—	—	—	553	—	—	—	950	—	(2) 5,866
Palestine	0	0	11	14	0	0	22	30	0	160
Algeria	—	0	—	11	—	0	—	76	(5) 39	(5) 95
Tunisia	—	0	—	18	—	0	—	133	(2) 0	(2) 153
Australia	—	0	—	0	—	0	—	0	0	0
New Zealand	—	0	—	0	—	0	—	0	(2) 0	(2) 56
Totals	—	12,577	—	14,826	—	27,801	—	31,402	—	—

(1) Up to November 30. — (2) Up to September 30. — (3) Up to August 31. — (4) Up to July 31. — (5) Up to June 30. — (6) Up to March 31. — (7) Up to December 31, 1938. — (8) From January 1, 1938 to March 31, 1939 excluding trade between Germany and Austria. — (9) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland, and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (10) Up to March 15 1939, the data refer to Czecho-Slovakia.

COUNTRIES	DECEMBER				TWELVE MONTHS (January 1-December 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938	1938
Rice. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Spain	—	—	—	—	0	2,197	3,497	(5) 1	5	—
Italy	—	530	—	—	(5) 3,093	3,254	(5) 711	581	—	—
United States	115	302	33	43	(5) 49	142	(5) 0	16	—	—
Mexico	—	0	—	—	(2) 1,181	1,236	—	—	—	—
Brazil	—	80	—	—	(2) 75,481	63,090	(5) 26	27	—	—
Burma	3,212	3,433	2	2	(2) 2,171	1,040	(5) 0	0	—	—
Chosen	—	143	—	—	(2) 255	223	(5) 0	0	—	—
Taiwan	—	3	—	—	(1) 32,020	22,309	(1) 194	263	—	—
Indochina	—	1,119	—	22	(5) 10	89	(5) 1	0	—	—
Iraq	—	1	—	—	(2) 795	(2) 14	12	—	—	—
Iran	—	0	—	—	—	—	—	—	—	—
Thailand (Siam)	3,008	2,135	—	—	40,323	32,151	—	—	—	—
Egypt	—	483	—	—	(1) 2,046	1,442	(1) 2	202	—	—
Madagascar	—	16	—	—	(5) 96	250	(5) 0	0	—	—
Australia	—	24	—	2	(2) 279	280	(2) 37	27	—	—
<i>Importing Countries:</i>										
Germany (8) (9)	—	37	—	654	(5) 201	503	(5) 4,161	6,077	—	—
Austria (8)	—	0	—	4	(7) 0	0	(7) 155	474	—	—
Belgo-Luxemb. E. U.	—	21	—	108	(1) 365	328	(1) 1,532	1,565	—	—
Bohemia-Moravia (Protectorate) (10)	—	0	—	139	(5) 0	0	(5) 305	1,052	—	—
Denmark	0	0	52	34	1	2	197	309	—	—
Estonia	—	—	—	1	—	—	(1) 19	24	—	—
Finland	—	—	—	1	—	—	(1) 185	297	—	—
France	—	58	—	335	(5) 68	342	(5) 7,552	13,250	—	—
Greece	0	0	102	48	0	0	647	625	—	—
Hungary	0	0	139	91	0	0	584	397	—	—
Ireland	—	0	—	13	(1) 0	0	(1) 57	77	—	—
Latvia	—	0	—	2	(1) 0	0	(1) 23	22	—	—
Lithuania	—	0	—	2	(1) 0	0	(1) 7	13	—	—
Norway	0	0	44	10	6	0	160	100	—	—
Netherlands	7	213	123	113	1,608	2,059	5,160	3,800	—	—
Poland-Danzig	—	6	—	0	(5) 13	129	(5) 394	1,064	—	—
Portugal	—	0	—	9	(2) 0	1	(2) 73	69	—	—
Romania	—	—	12	96	—	—	360	520	—	—
United Kingdom	—	14	—	198	(1) 70	98	(1) 2,517	3,013	—	—
Sweden	—	—	—	17	—	—	(1) 228	263	—	—
Switzerland	0	0	243	43	0	0	886	505	—	—
Yugoslavia	0	0	55	82	0	0	394	490	—	—
U. S. S. R.	—	0	—	0	—	34	—	881	—	—
Canada	—	0	—	26	(5) 21	7	(5) 606	592	—	—
Haiti	—	—	—	1	—	—	(1) 11	18	—	—
Argentina	0	0	—	35	2	1	(1) 668	1,108	—	—
Chile	—	—	—	39	—	—	(2) 183	271	—	—
Colombia	—	—	—	23	—	—	(5) 210	260	—	—
Peru	—	0	—	23	(2) 2	0	(2) 355	714	—	—
Ceylon	1	0	751	706	3	2	13,391	11,922	—	—
China	—	2	865	129	156	10	7,060	8,953	—	—
India: by sea	347	414	1,835	1,382	6,343	6,015	51,294	24,295	—	—
by land	—	44	—	152	(4) 319	469	(4) 1,325	1,787	—	—
Netherlands Indies:	—	—	—	—	—	—	—	—	—	—
Java and Madura	—	0	—	0	(1) 259	186	(1) 661	89	—	—
Outer Provinces	—	21	—	704	(1) 214	189	(1) 5,146	6,845	—	—
Japan	—	37	—	103	(3) 355	184	(3) 381	500	—	—
British Malaya	—	486	—	1,409	(2) 3,244	4,562	(2) 17,342	18,662	—	—
Manchukuo	—	2	—	151	(3) 4	305	(3) 1,546	1,277	—	—
Palestine	3	18	40	57	85	119	562	495	—	—
Syria and Lebanon	—	1	—	48	(4) 0	1	(4) 294	384	—	—
Algeria	—	34	—	192	(6) 79	65	(6) 232	1,067	—	—
French Morocco	—	—	—	8	—	—	(6) 71	236	—	—
Tunisia	—	0	—	6	(1) 0	1	(3) 9	502	—	—
Union of South Afr.	—	0	—	105	(2) 0	0	(2) 1,377	1,311	—	—
New Zealand	—	0	—	3	(1) 0	0	(3) 59	64	—	—
Totals	—	9,686	—	7,372	—	145,450	—	117,372	—	—

(1) Up to November 30. — (2) Up to October 31. — (3) Up to September 30. — (4) Up to August 31 — (5) Up to July 31.

(6) Up to June 30. — (7) Up to March 31. — (8) From January 1, 1938, to March 15, 1939, excluding trade between Germany and Austria. — (9) As from April 1, 1939, the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (10) Up to March 15, 1939, the data refer to Czechoslovakia.

COUNTRIES	DECEMBER				TWELVE MONTHS (January 1-December 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938	1938
Linseed. — Thousand centals (1 cental = 100 lb.)										
<i>Exporting Countries:</i>										
Latvia . . . . .	...	17	...	8	(4) 66	74	(4) 24	17	—	—
Lithuania . . . . .	...	60	...	0	(4) 155	125	(4) 0	0	—	—
Romania	0	0	0	0	3	0	2	5	—	—
Argentina	1 447	3,831	—	—	25,958	27,892	—	—	—	—
Uruguay	71	119	—	—	2,401	1,595	—	—	—	—
China	8	0	—	—	99	160	—	—	—	—
India: by sea	135	405	0	0	5,934	6,408	0	1	—	—
: by land	—	—	...	35	—	—	(4) 156	326	—	—
Iraq . . . . .	...	13	—	—	(5) 17	82	—	—	—	—
Manchukuo . . . . .	...	0	—	—	(3) 65	18	—	—	—	—
Egypt . . . . .	...	2	...	0	(1) 2	4	(1) 1	6	—	—
French Morocco . . . . .	...	5	—	—	(6) 39	127	—	—	—	—
Tunisia . . . . .	...	0	...	0	(3) 2	0	(3) 0	0	—	—
New Zealand . . . . .	...	0	...	0	(3) 0	0	(3) 0	0	—	—
<i>Importing Countries:</i>										
Germany (8) (9) . . . . .	...	{ 0 }	...	{ 331	(5) 0	0	(5) 2,417	3,418	—	—
Austria (8) . . . . .	...	{ 0 }	...	{ 0	(7) 0	0	(7) 2	5	—	—
Belgo-Luxemb. E. U. . . . .	...	6	...	233	(1) 97	93	(1) 2,116	1,886	—	—
Bohemia-Moravia (Protectorate) (10) . . . . .	...	0	...	22	(5) 0	0	(5) 188	385	—	—
Denmark	0	0	22	24	0	1	589	372	—	—
Spain	—	—	—	—	—	—	—	—	—	—
Estonia	—	0	...	0	(4) 3	5	(4) 0	0	—	—
Finland . . . . .	...	0	...	12	(4) 0	0	(4) 113	177	—	—
France	—	0	...	215	(5) 2	2	(5) 2,744	4,480	—	—
Greece	0	0	0	3	0	0	71	75	—	—
Hungary	0	0	2	0	0	0	34	65	—	—
Ireland . . . . .	...	0	...	11	(4) 0	0	(4) 130	139	—	—
Italy . . . . .	...	0	...	54	(5) 0	0	(5) 760	1,160	—	—
Norway	0	0	9	32	0	0	513	463	—	—
Netherlands	13	13	407	452	142	124	6,833	6,572	—	—
Poland-Danzig	—	0	—	0	(5) 0	0	(5) 38	0	—	—
Portugal	—	—	...	45	—	—	(2) 94	152	—	—
United Kingdom . . . . .	...	0	...	297	(4) 0	0	(4) 4,477	6,190	—	—
Sweden	—	—	...	42	—	—	(3) 946	1,074	—	—
Yugoslavia	0	0	2	25	0	0	159	216	—	—
Canada	4	1	...	6	10	7	(5) 335	399	—	—
United States	—	—	349	826	—	—	8,976	8,604	—	—
Burma	0	0	0	0	0	0	0	0	—	—
Japan . . . . .	...	0	...	6	(3) 0	2	(3) 39	177	—	—
Palestine	—	—	0	0	—	—	24	14	—	—
Algeria . . . . .	...	0	...	0	(6) 0	0	(6) 0	1	—	—
Australia	—	0	...	22	(2) 0	0	(2) 458	725	—	—
Totals	—	4,472	—	2,695	—	36,719	—	37,104	—	—

(1) Up to November 30 — (2) Up to October 31. — (3) Up to September 30 — (4) Up to August 31. — (5) Up to July 31. — (6) Up to June 30. — (7) Up to March 31. — (8) From January 1, 1938 to March 31, 1939 excluding trade between Germany and Austria. — (9) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia — (10) Up to March 15, 1939, the data refer to Czecho-Slovakia.

COUNTRIES	DECEMBER				FIVE MONTHS (August 1-December 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Cotton. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
United States . . .	4,246	1,938	48	55	16,620	10,081	286	326	17,564	749
Haiti . . .	0	0	—	—	(1) 1	2	—	—	104	—
Mexico . . .	1	1	—	—	(3) 32	177	(3) 3	3	308	9
Dominican Republic . . .	0	0	—	—	(1) 0	1	—	—	5	—
Argentina . . .	34	19	—	—	201	329	(1) 0	0	555	0
Brazil . . .	502	—	—	—	(2) 1,664	2,559	—	—	7,692	—
Peru . . .	178	—	—	—	574	982	—	—	1,801	—
Burma . . .	89	35	0	0	175	147	0	0	385	0
China . . .	9	155	326	106	48	1,148	1,988	225	1,305	3,698
India: by sea . . .	840	1,065	173	86	3,369	3,910	732	608	12,897	1,684
Netherlands Indies:										
Java and Madura . . .	3	—	—	—	(1) 1	5	—	—	19	—
Outer provinces . . .	3	—	—	—	(1) 7	7	—	—	19	—
Iraq . . .	5	—	—	0	—	29	—	1	53	2
Iran . . .	10	—	—	0	(2) 120	59	(2) 0	0	223	0
Syria and Lebanon . . .	0	—	—	0	(4) 1	8	(4) 0	0	55	1
Turkey . . .	0	47	—	—	25	258	—	—	385	—
Egypt . . .	860	—	—	—	(1) 2,896	3,282	—	—	8,429	—
French Morocco . . .	0	—	—	0	—	0	—	(5) 2	(5) 1	—
<i>Importing Countries:</i>										
Germany (8) (9) . . .	0	0	417	—	0	—	2,769	1	6,399	—
Austria (8) . . .	0	0	80	—	—	—	380	(6) 1	527	—
Belgo-Luxemb. E. U. . .	67	—	223	(1) 108	356	(1) 555	1,037	906	2,335	—
Bohemia-Moravia (Protectorate) (10) . . .	0	—	124	—	6	—	512	10	1,226	—
Bulgaria . . .	0	0	28	0	0	33	116	0	294	—
Denmark . . .	0	0	17	0	0	76	78	—	202	—
Spain . . .	—	—	—	—	—	—	—	—	—	—
Estonia . . .	0	—	13	(4) 0	0	(4) 13	61	0	150	—
Finland . . .	0	—	75	(4) 0	0	(4) 14	172	0	361	—
France . . .	26	—	655	—	131	—	2,680	514	5,765	—
Greece . . .	0	0	3	0	0	23	16	0	49	—
Hungary . . .	0	0	64	0	0	220	263	0	629	—
Italy . . .	0	—	292	—	0	—	1,306	0	2,742	—
Latvia . . .	0	—	7	—	0	—	40	0	103	—
Lithuania . . .	0	—	1	—	0	—	21	0	37	—
Norway . . .	0	0	15	0	0	43	46	0	88	—
Netherlands . . .	0	2	152	99	2	640	515	12	1,203	—
Poland - Danzig . . .	—	0	123	—	1	—	719	2	1,681	—
Portugal . . .	—	—	153	—	—	(2) 66	261	—	474	—
Romania . . .	0	0	51	0	0	87	224	0	433	—
United Kingdom . . .	31	—	970	—	205	—	4,427	555	10,509	—
Sweden . . .	—	—	174	—	—	(3) 67	405	—	920	—
Switzerland . . .	0	0	63	0	0	444	241	0	661	—
Yugoslavia . . .	0	0	36	59	0	147	746	0	515	—
U. S. S. R. . . .	88	—	3	—	88	—	13	(7) 88	(7) 13	—
Canada . . .	—	—	99	—	—	—	636	—	1,269	—
Colombia . . .	—	—	10	—	—	—	39	—	(5) 112	—
Ceylon . . .	—	—	3	—	—	15	7	0	17	—
Chosen . . .	—	0	54	(2) 0	0	(2) 78	141	0	348	—
Taiwan . . .	—	—	0	—	—	0	0	—	1	—
Indochina . . .	—	0	11	(1) 2	3	(1) 47	30	5	601	—
Japan . . .	—	—	1,323	(3) 0	1	2,269	5,573	1	13,176	—
Manchukuo . . .	—	0	106	(3) 0	0	(3) 57	582	0	682	—
Palestine . . .	0	—	1	1	0	10	5	0	16	—
Algeria . . .	—	0	—	—	—	—	2	(5) 1	4	—
Union of South Afr. . .	—	0	1	(2) 0	3	(2) 5	6	3	13	—
Australia . . .	—	0	7	(2) 0	0	(2) 33	59	0	121	—
Totals . . .	—	5,041	—	5,570	—	23,784	—	24,791	53,899	59,820

(1) Up to November 30. — (2) Up to October 31. — (3) Up to September 30. — (4) Up to August 31. — (5) Up to June 30. — (6) Up to March 31. — (7) Up to December 31, 1938. — (8) From January 1, 1938 to March 31, 1939 excluding trade between Germany and Austria. — (9) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sude-
 terland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (10) Up
 to March 15, 1939 the data refer to Czechoslovakia.

COUNTRIES	DECEMBER				FOUR MONTHS (September 1-December 31)				TWELVE MONTHS (Sept. 1-Aug. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Wool. — Thousand lb.										
<i>Exporting Countries:</i>										
Ireland	1,056	...	93	...	5,558	...	276	16,892	963	
Argentina	29,937	40,451	—	—	59,020	87,700	—	299,162	—	
Chile	6,889	5,106	—	—	21,724	19,701	—	56,752	—	
Peru	5,247	...	51	(2) 201	5,556	(2) 35	302	30,838	461	
Uruguay	963	—	—	(2) 2,377	3,635	—	—	12,022	—	
Burma	13,380	—	—	(2) 12,086	31,943	—	—	95,934	—	
China	2,432	—	—	(2) 4,182	6,682	—	—	24,441	—	
India: by sea	0	24	0	82	84	0	0	311	0	
India: by land	106	344	—	320	4,187	—	—	6,671	—	
Iraq	5,143	9,268	183	450	21,056	29,983	1,325	2,000	76,992	8,031
Iran	—	1,565	—	1,371	—	—	—	5,439	20,097	
Manchukuo	—	0	—	0	6,764	—	4	(4) 17,238	(4) 57	
Palestine	—	0	—	(2) 789	714	(2) 0	0	6,151	0	
Syria and Lebanon . .	—	388	—	(3) 13	1,288	(3) 0	0	3,567	295	
Turkey	24	15	0	0	33	—	4	11	181	40
Algeria	71	—	—	42	—	—	—	176	8,622	423
Egypt	1,451	1,922	—	—	4,332	—	—	—	21,272	—
French Morocco . . .	—	2,366	—	190	—	—	—	849	(5) 16,484	(5) 2,410
Tunisia	—	240	—	46	(1) 1,184	1,614	(1) 35	157	5,176	465
Un of S Africa	—	787	—	0	—	3,847	—	9	(5) 10,717	(5) 40
Australia	251	—	—	7	(1) 0	820	(1) 0	35	2,172	218
New Zealand	24,119	4,180	322	45,927	64,587	—	—	747	197,226	1,058
— (a)	694	624	—	141	2,853	(2) 97	509	7,994	1,587	
— (b)	—	109,608	—	2,068	(1) 23,552	366,293	(2) 1,078	3,300	799,315	15,655
— (c)	—	8,642	—	9	(2) 3,785	26,996	(2) 66	132	68,809	604
— (d)	—	24,205	—	24	(1) 4,969	33,069	(1) 0	46	254,591	55
— (e)	—	1,627	—	0	(1) 3,660	10,150	(1) 0	4	57,270	4
<i>Importing Countries:</i>										
Germany (7) (8) . . .	(a) 2	16,319	—	4	—	41,266	(1) 24	(1) 245,898		
Austria (7)	(b) 0	3,225	—	31	—	11,682	(4) 7	(1) 27,569		
Belgo-Luxemb. (a) . .	—	1,993	—	—	—	6,164	(4) 31	(1) 12,610		
Econ. Un. (b)	4,980	26,943	(2) 5,650	15,274	(1) 4,601	55,175	(5) 76	57,576	220,450	
Bohemia-Moravia . . .	2,798	507	(1) 7,421	10,728	(1) 545	1,671	32,659	7,496		
(Protectorate) (9) . .	207	1,601	—	236	—	4,658	(1) 395	(1) 13,722		
Bulgaria	0	132	44	0	207	884	—	0	1,790	
Denmark	0	33	256	377	97	115	1,078	2,242	419	8,774
Spain	—	—	—	—	—	—	—	—	—	937
Estonia	—	37	—	—	—	256	—	—	—	6,420
Finland	—	505	—	—	—	2,088	112	—	—	409,133
France	6,455	51,271	—	19,348	—	107,650	(4) 58,076	(1) 409,133		
Greece	75	68	66	573	172	617	1,045	1,700	2,103	7,657
Hungary	0	51	364	333	0	150	626	767	1,027	3,208
Italy	(a) 33	5,589	—	82	—	23,371	(1) 1,047	(1) 61,489		
Latvia	(b) 35	344	—	551	—	1,519	(4) 1,389	(4) 4,385		
Lithuania	—	123	—	—	—	635	—	—	—	2,101
Norway	—	106	—	—	—	346	—	—	—	1,001
Netherlands	88	198	251	174	313	595	648	957	1,689	2,668
Poland - Danzig	75	108	575	556	126	366	3,527	2,888	3,166	11,572
Portugal	0	35	558	776	9	99	4,489	3,699	756	12,225
Romania	—	—	—	3,146	—	15,393	(4) 4	(4) 56,838		
United Kingdom	—	225	—	712	(2) 1,444	395	(2) 459	1,074	2,251	3,318
Sweden	0	29	2	29	—	0	73	381	62	840
Switzerland	—	28,951	—	82,993	—	79,133	—	233,527	287,638	1,036,529
Yugoslavia	—	1,444	—	1,444	—	(3) 1,803	—	—	—	32,075
Canada	0	33	1,243	1,640	0	66	3,170	4,486	423	21,220
United States	0	11	461	1,453	0	220	1,082	4,394	353	11,475
Mexico	—	260	—	818	—	1,296	—	4,072	(4) 3,455	(4) 18,715
Japan	26	42	26,037	18,162	33	258	98,401	62,120	419	209,678
— (a)	—	390	—	(3) 0	—	(3) 456	—	1,398	139	4,837
— (b)	—	0	—	(3) 0	—	(3) 7,527	—	29,716	0	107,551
Totals	—	279,287	—	233,293	—	861,015	—	648,430	2,551,020	2,616,646

(a) Unwashed wool. — (b) Washed wool.

(1) Up to November 30. — (2) Up to October 31. — (3) Up to September 30. — (4) Up to July 31. — (5) Up to June 30. — (6) Up to March 31. — (7) From January 1, 1938 to March 31, 1939 excluding trade between Germany and Austria. — (8) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (9) Up to March 15, 1939, the data refer to Czechoslovakia.

COUNTRIES	DECEMBER				TWELVE MONTHS (January 1-December 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938	1938
Butter. — Thousand lb.										
<i>Exporting Countries:</i>										
Bulgaria . . .	0	7	0	0	11	53	0	0	—	—
Denmark . . .	24,703	26,348	0	0	330,267	348,459	2	0	—	—
Estonia . . .	..	1,706	..	0	(4) 23,129	32,479 (4)	0	0	—	—
Finland . . .	..	2,057	..	0	(4) 27,593	37,765 (4)	0	0	—	—
France . . .	..	602	..	84	(5) 3,466	6,449 (5)	1,153	1,340	—	—
Hungary . . .	66	273	0	0	3,307	7,760	0	0	—	—
Ireland . . .	..	690	..	0	(1) 21,378	42,278 (4)	238	644	—	—
Italy . . .	..	139	..	51	(5) 970	1,859 (5)	470	463	—	—
Latvia . . .	..	2,820	..	0	(4) 35,633	51,714 (1)	0	0	—	—
Lithuania . . .	..	1,484	..	0	(4) 27,419	38,387 (1)	0	0	—	—
Norway . . .	4	40	0	0	126	1,797	0	0	—	—
Netherlands . . .	5,527	6,109	0	0	124,420	112,141	0	7	—	—
Poland-Danzig . . .	..	626	..	0	(5) 18,958	29,086 (5)	0	0	—	—
Romania . . .	46	0	0	0	924	256	0	0	—	—
Sweden . . .	..	2,789	..	0	(3) 47,589	62,953 (3)	4	2	—	—
Yugoslavia . . .	0	13	..	..	260	196	..	..	—	—
U. S. S. R. . . .	..	121	..	26	..	743	..	708	—	—
Canada . . .	..	185	..	0	(5) 10,538	3,821 (5)	4	5,232	—	—
Argentina . . .	2,493	3,007	..	..	19,729	16,173	..	..	—	—
Syria and Lebanon . . .	..	95	..	13	(4) 1,254	1,089 (1)	51	64	—	—
Union of South Afr. . .	..	445	..	2	(2) 5,126	3,536 (1)	24	2	—	—
Australia . . .	..	31,257	..	0	(2) 184,838	229,407 (2)	4	0	—	—
New Zealand . . .	..	18,495	..	0	(1) 241,149	293,233 (3)	2	9	—	—
<i>Importing Countries:</i>										
Germany (8) (9) . . .	..	0	..	16,118	(5) 0	0 (5) 110,44	204,113	..	..	..
Austria (8) . . .	..	0	..	159	(7) 0	2,606 (7)	86	165	..	..
Belgo-Luxemb. E. U. . .	..	9	..	721	(1) 26	51 (1) 2,081	2,340	..	..	..
Bohemia-Moravia (Protectorate) (10) . . .	..	4	..	712	(5) 68	1,773 (5) 2,335	2,264	..	..	..
Spain . . .	..	..	..	..	..	..	..	..	..	..
Greece . . .	..	..	86	128	..	..	1,074	1,151	..	..
Portugal . . .	..	26	..	0	(2) 115	115 (2)	6	0	..	..
United Kingdom . . .	..	1,847	..	79,426	(4) 7,216	10,174 (1) 732,658	1,065,630	..	..	..
Switzerland . . .	2	2	875	55	22	11	3,161	344	..	..
United States . . .	119	159	75	73	2,308	1,960	1,107	1,144	..	..
Mexico . . .	..	..	..	46	..	..	104	174	..	..
Peru . . .	..	0	..	62	(2) 0	194 (3)	280	355	..	..
Burma . . .	..	..	37	79	..	..	719	668	..	..
Ceylon . . .	..	..	141	73	..	..	1,109	858	..	..
China . . .	..	..	44	44	..	..	593	531	..	..
India: by sea . . .	505	578	110	88	5,785	6,116	1,065	968	..	..
" : by land . . .	..	..	..	483	..	..	(4) 3,997	5,908	..	..
Netherlands Indies . . .	..	..	..	952	..	..	(1) 5,956	7,335	..	..
Java and Madura . . .	..	..	..	302	..	..	(1) 2,238	2,568	..	..
Outer Provinces . . .	..	..	..	..	..	..	..	..	..	..
Indochina . . .	..	0	..	84	(1) 4	..	(1) 2,008	820	..	..
Iraq . . .	..	0	..	4	(5) 2	..	(5) 29	31	..	..
Iran . . .	..	0	..	0	(2) 4	20 (2)	172	0	..	..
British Malaya . . .	..	66	..	313	(2) 580	650 (2)	4,317	4,691	..	..
Palestine . . .	0	0	304	309	..	7	4,389	4,494	..	..
Algeria . . .	..	0	..	384	(6) 11	11 (6)	1,922	4,332	..	..
Egypt . . .	..	42	..	77	(1) 254	335 (1)	816	1,325	..	..
French Morocco . . .	..	..	..	110	..	..	(6) 1,146	1,953	..	..
Tunisia . . .	..	0	..	218	(3) 4	2 (3)	955	1,475	..	..
Totals . . .	—	102,039	—	101,196	—	1,345,659	—	1,324,307	—	—

(1) Up to November 30 — (2) Up to October 31 — (3) Up to September 30. — (4) Up to August 31 — (5) Up to July 31. — (6) Up to June 30 — (7) Up to March 31. — (8) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria. — (9) As from April 1, 1939 the data refer to the territory of the former Reich Ostmark the Sudetenland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (10) Up to March 15, 1939, the data refer to Czechoslovakia.

COUNTRIES	DECEMBER				TWELVE MONTHS (January 1-December 31)				TWELVE MONTHS (Jan. 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938	1938
Cheese. — Thousand lb.										
<i>Exporting Countries:</i>										
Bulgaria	46	236	0	0	1,389	3,660	0	0	—	—
Denmark	1,717	1,647	2	0	21,140	20,082	22	20	—	—
Estonia . . . . .	...	115	...	0	(4) 467	507	(4) 2	2	—	—
Finland . . . . .	...	1,470	...	7	(4) 8,073	14,930	(4) 15	35	—	—
Hungary	55	79	2	0	741	787	2	2	—	—
Ireland . . . . .	...	271	...	4	(4) 794	2,262	(4) 26	40	—	—
Italy . . . . .	...	4,643	...	320	(5) 27,690	53,286	(5) 5,293	10,221	—	—
Latvia . . . . .	...	62	...	0	(4) 214	309	(4) 0	0	—	—
Lithuania . . . . .	...	223	...	0	(4) 238	2,004	(4) 0	0	—	—
Norway	324	362	46	55	3,966	3,642	648	518	—	—
Netherlands	9,581	9,614	37	68	114,531	128,953	615	692	—	—
Poland-Danzig . . . . .	...	11	—	24	(5) 218	500	(5) 238	317	—	—
Romania	15	2	4	13	353	110	64	68	—	—
Switzerland	4,947	3,314	425	390	46,432	49,348	3,741	3,360	—	—
Yugoslavia	421	168	2	4	3,803	3,384	40	46	—	—
Canada . . . . .	...	7,575	...	148	(5) 28,138	80,989	(5) 670	1,387	—	—
Argentina	384	481	...	15	5,474	4,363	(1) 68	108	—	—
Union of South Afr. . . . .	...	269	...	29	(2) 3,560	2,716	(2) 238	362	—	—
Australia . . . . .	...	5,529	...	15	(2) 30,126	34,732	(2) 110	143	—	—
New Zealand . . . . .	...	12,547	...	0	(1) 168,844	180,381	(3) 2	9	—	—
<i>Importing Countries</i>										
Germany (7) (8) . . . . .	...	82	...	6,585	(5) 302	225	(5) 38,367	72,091	—	—
Austria (7) . . . . .	...	37	...	126	(7) 44	3,536	(7) 370	1,726	—	—
Belgo-Luxemb. E. U. . . . .	...	31	...	3,902	(1) 216	280	(1) 48,268	53,312	—	—
Bohemia-Moravia (Protectorate) (9) . . . . .	...	33	...	348	(4) 146	1,753	(5) 2,299	3,071	—	—
Spain . . . . .	...	—	—	—	—	—	—	—	—	—
France . . . . .	...	2,820	...	2,458	(5) 17,712	26,467	(5) 17,650	31,301	—	—
Greece	4	2	214	121	95	172	2,198	1,534	—	—
Portugal . . . . .	...	9	...	55	(2) 170	154	(2) 146	245	—	—
United Kingdom . . . . .	...	368	...	22,833	(4) 2,787	4,859	(4) 217,998	329,200	—	—
Sweden . . . . .	...	—	...	417	—	—	(3) 2,798	2,687	—	—
U. S. & R . . . . .	...	7	...	13	—	71	—	337	—	—
United States	123	132	3,479	4,083	1,479	1,482	59,073	54,432	—	—
Mexico . . . . .	...	0	...	132	(3) 4	4	(3) 697	1,010	—	—
Chile . . . . .	...	29	...	4	(2) 7	42	(2) 75	79	—	—
Peru . . . . .	...	0	...	51	(2) 2	0	(2) 562	816	—	—
Burma . . . . .	...	—	7	7	—	—	97	90	—	—
Ceylon . . . . .	...	—	9	20	—	—	194	243	—	—
India: by sea	0	0	134	—	4	2	992	1,164	—	—
Netherlands Indies Java and Madura . . . . .	...	—	...	115	—	—	(1) 1,746	2,035	—	—
Indochina . . . . .	...	0	...	49	(1) 2	2	(1) 494	578	—	—
Iraq . . . . .	...	0	...	9	(5) 15	11	(5) 42	62	—	—
Japan . . . . .	...	—	...	0	—	—	(3) 4	42	—	—
British Malaya . . . . .	...	2	...	24	(2) 29	33	(2) 342	392	—	—
Palestine	4	7	117	254	20	35	2,072	2,112	—	—
Syria and Lebanon . . . . .	...	117	...	40	(4) 875	783	(4) 421	591	—	—
Algeria . . . . .	...	2	...	1,105	(6) 7	35	(6) 6,605	12,432	—	—
Egypt . . . . .	...	7	...	509	(1) 55	90	(1) 4,747	7,478	—	—
French Morocco . . . . .	...	—	...	397	—	—	(6) 1,510	3,444	—	—
Tunisia . . . . .	...	2	...	262	(3) 121	62	(3) 1,911	2,683	—	—
Totals	—	52,305	—	45,201	—	627,043	—	602,521	—	—

(1) Up to November 30. — (2) Up to October 31. — (3) Up to September 30. — (4) Up to August 31. — (5) Up to July 31. — (6) Up to June 30. — (7) Up to March 31. — (8) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria. — (9) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel, they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (10) Up to March 15, 1939, the data refer to Czechoslovakia.

COUNTRIES	DECEMBER				THREE MONTHS (October 1-December 31)				TWELVE MONTHS (Oct. 1-Sept. 30)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Cacao. — Thousand lb.										
<i>Exporting Countries:</i>										
Grenada	661	—	—	...	1,495	—	—	(3) 7,754	—
Haiti	489	—	—	(1) 1,003	1,788	—	—	3,979	—
Dominican Republic	3,523	—	—	(1) 2,028	7,659	—	—	63,690	—
Brazil	33,153	—	—	(2) 24,097	83,699	—	—	281,271	—
Ecuador	2,242	—	—	(2) 924	7,804	—	—	36,174	—
Trinidad	1,473	—	—	(2) 540	4,156	—	—	17,921	—
Ceylon	1,054	703	—	—	2,665	1,984	—	—	7,754	—
Netherlands Indies:										
Java and Madura	392	—	—	(1) 337	906	—	—	3,098	—
Cameroon; Fr. m. t.	8,607	—	—	...	18,111	—	—	(6) 63,396	—
Belgian Congo	386	—	—	(2) 337	675	—	—	2,806	—
Ivory Coast	13,204	—	—	...	20,029	—	—	(5) 102,533	—
Gold Coast	54,721	89,898	—	—	117,302	142,373	—	—	643,415	—
Madagascar	187	—	—	...	282	—	—	(4) 793	—
Nigeria and Came- roon	30,830	—	—	(1) 23,001	47,366	—	—	259,104	—
São Thomé and Prin- cipe Islands	6,532	—	—	(1) 4,927	8,830	—	—	23,202	—
Togo; Fr. m. t.	692	—	—	...	3,106	—	—	22,688	—
<i>Importing Countries:</i>										
Germany (8) (9)	0	...	19,145	...	0	...	53,326	(4) 0	(1) 174,336
Austria (8)	0	...	3,413	...	0	...	6,700	(7) 0	(7) 11,594
Belgo-Luxemb. E. U.	0	...	2,000	(1) 0	0	(1) 6,204	6,288	168	26,678
Bohemia-Moravia (Protectorate) (10)	—	...	2,934	—	—	...	6,875	—	(4) 20,655
Bulgaria	—	62	192	—	—	223	608	—	2,121
Denmark	0	0	2,262	950	0	0	4,826	2,189	15	11,133
Spain	—	—	—	...	—	—	—	—	—
Estonia	—	—	42	...	—	—	278	—	(3) 1,109
Finland	—	—	20	...	—	—	106	—	(3) 487
France	300	...	7,884	...	300	...	25,186	(4) 302	(4) 86,741
Greece	0	0	82	679	2	0	366	1,404	0	4,101
Hungary	—	474	1,043	...	—	1,045	2,027	—	13,045
Ireland	—	—	262	...	—	—	1,109	—	(3) 6,967
Italy	—	—	3,920	...	—	—	5,154	—	(4) 16,153
Latvia	0	...	99	...	0	...	633	(1) 0	(3) 1,742
Lithuania	—	—	68	...	—	—	410	—	(4) 974
Norway	0	0	1,252	306	0	0	2,795	1,515	0	8,186
Netherlands	0	231	8,128	11,480	0	1,021	22,743	37,562	1,537	180,200
Poland-Danzig	—	—	2,004	...	—	—	6,142	—	(4) 17,807
Portugal	0	...	146	(2) 0	0	(2) 174	353	2	1,215
Romania	—	161	276	...	—	425	1,184	—	3,783
United Kingdom	1,047	...	24,077	...	3,635	...	41,363	(3) 9,374	(3) 287,576
Sweden	—	—	1,246	...	—	—	4,661	—	17,692
Switzerland	0	26	4,738	1,444	0	44	9,334	3,428	44	21,874
Yugoslavia	—	170	238	...	—	430	840	—	3,157
Canada	—	—	2,019	...	—	—	5,994	—	(4) 24,101
United States	—	38,151	55,587	...	—	162,655	82,731	—	583,184
Mexico	—	—	108	...	—	—	238	—	1,345
Argentina	—	—	756	...	—	(1) 1,715	2,233	—	10,966
Chile	—	—	106	...	—	(2) 128	348	—	2,081
Colombia	—	—	538	...	—	—	1,695	—	(5) 6,360
Peru	0	...	0	(2) 0	0	(2) 66	84	0	620
Uruguay	—	60	79	...	—	—	472	—	1,334
Iran	—	—	11	...	—	(2) 15	31	—	128
Japan	—	—	33	...	—	—	796	—	1,541
British Malaya	4	...	2	(2) 0	22	(2) 0	11	104	88
Palestine	—	79	22	...	—	—	112	—	1,451
Algeria	0	...	62	...	0	...	128	(5) 0	(5) 489
Egypt	—	—	148	...	—	(1) 331	445	—	639
French Morocco	—	—	0	...	—	—	42	—	(5) 139
Tunisia	—	—	2	...	—	—	4	—	11
Union of South Africa	—	—	397	...	—	(2) 20	635	—	2,377
Australia	0	...	71	(2) 0	0	(2) 55	284	11	14,919
New Zealand	—	—	79	...	—	—	600	—	4,191
Totals	—	194,580	—	123,888	—	355,285	—	307,171	1,551,143	1,575,290

(1) Up to November 30. — (2) Up to October 31 — (3) Up to August 31. — (4) Up to July 31. — (5) Up to June 30. — (6) Up to May 31. — (7) Up to March 31. — (8) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria. — (9) As from April 1, 1939 the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel; they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (10) Up to March 15, 1939 the data refer to Cecho-Slovakia.

COUNTRIES	DECEMBER				SIX MONTHS (July 1-December 31)				TWELVE MONTHS (July 1-June 30)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Tea. — Thousand lb.										
<i>Exporting Countries:</i>										
Ceylon	22,862	18,155	0	0	105,238	108,322	0	0	231,627	0
China	11,923	7,103	930	203	29,875	63,511	7,304	1,942	83,388	7,015
Chosen . . . . .	...	11	...	0	(2) 234	123	(2) 0	0	269	0
Taiwan . . . . .	...	2,253	...	0	(3) 4,605	16,440	(3) 0	0	20,435	0
India: by sea	44,840	38,621	179	902	249,106	266,767	853	2,302	334,500	4,799
" by land . . . . .	...	1,398	—	—	(4) 1,330	6,898	—	—	13,618	—
Netherlands Indies										
Java and Madura . .	...	10,778	...	40	(1) 52,693	60,804	(1) 181	306	127,258	483
Outer Provinces . .	...	2,784	—	—	(1) 13,071	16,226	—	—	32,428	—
Indochina . . . . .	...	439	...	68	(1) 2,908	2,709	(1) 225	637	4,738	944
Japan . . . . .	...	3,761	...	11	(3) 17,203	23,129	(3) 44	86	35,023	130
<i>Importing Countries:</i>										
Germany (8) (9) . .	...	20	...	1,109	(5) 15	88	(5) 1,689	6,654	165	15,040
Austria (8) . . . .	...	0	...	161	...	0	...	668	0	1,043
Belgo-Luxemb. R.U.	...	0	...	53	(1) 7	0	(1) 284	302	2	664
Bohemia-Moravia (Protectorate) (10)	—	—	...	101	—	—	(5) 49	721	—	1,336
Bulgaria . . . . .	...	7	...	9	...	...	29	40	—	60
Denmark	0	2	240	75	0	2	937	847	2	1,561
Spain	—	—	—	—	—	—	—	—	—	—
Estonia	—	—	...	4	—	—	(4) 15	51	—	101
Finland	—	—	...	24	—	—	(4) 44	170	—	317
France . . . . .	...	0	...	262	(5) 0	9	(5) 201	1,332	13	2,800
Greece	—	—	4	42	—	—	181	227	—	414
Hungary	—	—	7	44	—	—	176	340	—	677
Ireland . . . . .	...	0	...	1,488	(4) 7	26	(4) 2,315	12,183	33	23,715
Italy . . . . .	...	—	...	33	—	—	(5) 60	97	—	311
Latvia . . . . .	...	0	...	4	(4) 0	0	(4) 11	31	0	71
Lithuania . . . . .	...	—	...	15	—	—	(4) 7	46	—	95
Norway	0	0	68	37	0	0	243	201	0	397
Netherlands	11	18	2,760	1,773	57	93	18,887	14,778	203	30,448
Poland-Danzig . . .	—	0	—	320	(5) 0	0	(5) 419	1,931	0	4,127
Portugal	—	—	...	31	—	—	(2) 99	176	—	317
Romania	—	—	24	97	—	—	489	362	—	800
United Kingdom . .	...	4,870	...	51,992	(4) 8,922	30,865	(4) 83,344	320,672	67,030	501,487
Sweden	—	—	...	73	—	—	(3) 355	578	—	1,206
Switzerland	0	0	335	143	4	7	1,263	1,003	9	1,978
Yugoslavia	—	—	11	55	—	—	172	289	—	485
U. S. S. R. . . . .	...	214	...	12,403	...	1,510	...	23,281	(7) 1,510	(7) 23,281
Canada	—	—	...	3,126	—	—	(5) 1,437	18,821	—	41,306
United States . . .	—	—	11,954	7,602	—	—	51,165	43,019	—	89,601
Mexico	—	—	...	4	—	—	(3) 15	35	—	84
Argentina	—	—	...	712	—	—	(1) 2,013	2,701	—	4,802
Chile	—	—	...	556	—	—	(2) 2,044	3,170	—	6,792
Peru	—	—	...	99	—	—	(2) 317	595	—	1,074
Uruguay	—	—	9	20	—	—	205	269	—	450
Burma	57	4	271	256	487	123	1,127	395	163	2,255
Iraq . . . . .	...	0	...	620	(5) 0	55	(5) 564	3,470	71	7,300
Iran . . . . .	...	0	...	1,380	(2) 0	0	(2) 4,817	8,300	0	17,785
British Malaya . . .	...	119	...	527	(2) 459	664	(2) 1,592	2,661	1,495	5,060
Manchukuo	—	—	...	1,470	—	—	(3) 6,352	11,248	—	17,655
Palestine	7	0	90	66	7	0	328	291	0	675
Syria and Lebanon .	...	—	...	77	(4) 0	0	(4) 40	258	0	465
Turkey	—	—	159	172	—	—	1,030	990	—	2,174
Algeria	—	0	...	218	—	2	—	1,872	2	3,217
Egypt	—	—	...	1,757	—	—	(1) 5,785	8,331	—	16,535
French Morocco . .	—	0	...	1,334	—	487	—	11,462	712	17,899
Tunisia	—	—	...	465	—	—	(3) 1,113	2,423	—	5,562
Union of South Afr.	...	60	...	1,420	(2) 174	227	(2) 6,120	8,655	659	16,865
Australia . . . . .	...	37	...	3,532	(2) 245	273	(2) 18,036	26,145	461	48,628
New Zealand . . . .	...	0	...	1,010	(3) 26	82	(3) 3,470	5,703	165	11,407
Totals	—	90,647	—	97,995	—	599,442	—	553,067	955,979	943,693

(1) Up to November 30 — (2) Up to October 31. — (3) Up to September 30. — (4) Up to August 31. — (5) Up to July 31. — (6) Up to March 31. — (7) Up to December 31, 1938. — (8) From January 1, 1938 to March 31, 1939, excluding trade between Germany and Austria. — (9) As from April 1, 1939, the data refer to the territory of the former Reich, Ostmark, the Sudetenland and Memel, they do not include trade between these territories and the Protectorate of Bohemia-Moravia. — (10) Up to March 15, 1939 the data refer to Czecho-Slovakia

COUNTRIES	DECEMBER				SIX MONTHS (July 1-December 31)				TWELVE MONTHS (July 1-June 30)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1939	1938	1939	1938	1939	1938	1939	1938	1938-39	1938-39
Coffee. — Thousand lb.										
<i>Exporting Countries:</i>										
Costa-Rica . . . . .	...	4,136	—	—	(1) 5,124	8,591	—	—	45,429	—
Guadaloupe . . . . .	...	0	—	—	...	51	—	—	754	—
Guatemala . . . . .	...	12,921	—	—	(1) 16,594	30,472	—	—	94,488	—
Jamaica . . . . .	...	432	—	—	(1) 2,476	4,226	—	—	9,808	—
Haiti . . . . .	...	6,744	—	—	(1) 16,976	24,932	—	—	64,854	—
Mexico . . . . .	...	11,169	—	—	(3) 4,777	22,728	—	—	79,766	—
Nicaragua . . . . .	...	344	—	—	(4) 1,823	4,343	—	—	40,305	—
Dominican Republic	...	2,297	—	—	(1) 6,799	7,670	—	—	30,459	—
Salvador	4,171	8,042	—	—	...	14,564	25,944	—	130,792	—
Brazil . . . . .	...	180,941	—	—	(2) 807,287	1,113,113	—	—	2,155,720	—
Colombia	51,718	44,721	—	—	...	237,384	280,967	—	537,319	—
Ecuador . . . . .	...	...	—	—	(1) 6,715	23,100	—	—	31,326	—
Netherlands Guiana.	...	732	—	—	(2) 2,544	3,272	—	—	5,404	—
Peru . . . . .	...	701	...	0	(2) 3,512	3,812	(2)	0	6,546	4
Venezuela . . . . .	...	4,817	—	—	(1) 17,549	35,464	—	—	88,346	—
Aden: by sea . . . . .	...	990	—	—	(1) 3,706	5,679	—	—	11,380	—
India: by sea	613	655	0	0	...	4,771	3,109	0	23,153	7
Netherlands Indies:										
Java and Madura . . . . .	...	2,956	—	—	(1) 30,139	29,480	—	—	55,202	—
Outer Provinces . . . . .	...	7,923	—	—	(1) 43,976	67,285	—	—	106,993	—
Indochina . . . . .	...	262	...	13	(1) 917	514	(1)	31	1,459	106
Belgian Congo . . . . .	...	3,988	—	—	(1) 13,790	19,524	—	—	45,299	—
Ivory Coast . . . . .	...	2,363	—	—	...	12,165	—	—	32,221	—
Kenya . . . . .	...	5,631	—	—	(2) 7,255	14,220	—	—	38,142	—
Uganda . . . . .	...	3,056	—	—	(4) 6,294	17,472	—	—	35,084	—
Madagascar . . . . .	...	17,247	—	—	(4) 1,089	53,762	—	—	76,214	—
Tanganyika . . . . .	...	2,388	—	—	(4) 12,031	19,659	—	—	30,622	—
<i>Importing Countries:</i>										
Germany (a) (10) . . . . .	...	0	...	41,363	(15) 0	0	(5) 29,912	228,420	0	403,613
Austria (a) . . . . .	...	0	...	1,543	...	...	...	8,955	(7) 0	(7) 14,326
Belgo-Luxemb. E. U. . . . .	...	849	...	8,514	(1) 254	3,583	(1) 50,158	56,370	4,017	118,025
Bohemia-Moravia (Protectorate) (11)	—	—	...	1,545	—	—	(5) 1,411	12,489	—	25,477
Bulgaria	—	84	11,286	95	—	—	525	591	—	1,279
Denmark	18	0	...	3,199	172	0	50,312	41,066	115	82,050
Estonia	—	—	...	26	—	—	(1) 60	146	—	295
Finland	—	—	...	3,781	—	—	(4) 13,955	27,346	—	56,031
France . . . . .	...	0	...	33,041	(5) 0	53	(5) 26,861	187,541	60	389,272
Greece	—	1,074	...	1,517	—	—	5,273	7,853	—	13,018
Hungary	—	71	...	247	—	—	2,125	2,427	—	5,390
Ireland . . . . .	...	0	...	15	(4) 0	11	(1) 110	201	11	542
Italy . . . . .	...	0	...	5,770	(5) 0	7	(5) 5,842	39,401	7	79,503
Latvia . . . . .	...	0	...	24	(1) 0	0	(4) 95	198	0	463
Lithuania	—	—	...	44	—	—	(4) 37	165	—	320
Norway	0	11	6,768	2,624	7	71	23,030	20,492	104	44,174
Netherlands	496	1,113	7,774	9,738	3,777	8,087	49,326	62,779	16,339	113,585
Poland-Danzig	—	0	...	1,082	(5) 0	2	(5) 1,378	7,097	4	14,654
Portugal . . . . .	...	205	...	831	(2) 966	825	(2) 5,992	6,270	1,903	13,761
Romania	—	331	...	503	—	—	2,915	3,547	—	8,025
United Kingdom . . . . .	...	461	...	1,812	(1) 1,387	7,513	(4) 1,722	6,204	12,295	49,739
Sweden	—	—	...	9,852	—	—	(3) 36,301	61,798	—	115,525
Switzerland	0	0	6,524	3,126	42	0	26,019	19,590	4	42,426
Yugoslavia	—	—	1,475	1,506	—	—	7,862	7,884	0	15,839
U. S. S. R.	—	—	...	209	—	—	...	1,556	(8) 1,556	—
Canada . . . . .	...	18	...	3,091	(5) 11	123	(5) 2,795	18,770	351	45,367
United States	1,431	1,019	199,488	174,840	6,634	3,878	1,022,618	974,266	10,598	1,965,955
Argentina	—	—	...	4,068	—	—	(1) 29,774	28,570	—	50,892
Chile	—	—	...	216	—	—	(2) 3,982	3,521	—	6,967
Uruguay	—	397	...	174	—	—	2,484	2,954	—	5,540
Ceylon	93	0	24	29	359	7	126	154	269	302
Burma	2	0	198	328	2	0	2,017	1,605	2	3,170
Iraq . . . . .	...	0	...	104	(5) 0	0	(5) 247	761	0	2,588
Iran . . . . .	...	0	...	110	(2) 0	0	(2) 40	639	0	802
Japan	77	...	...	1,118	(3) 20	247	(3) 231	4,458	326	6,279
British Malaya . . . . .	...	452	...	1,329	(2) 3,397	3,168	(2) 8,435	9,462	7,297	21,030
Palestine	0	0	309	216	4	0	1,296	1,237	0	3,624
Syria and Lebanon . . . . .	...	0	...	225	(4) 0	0	(4) 613	1,224	0	3,122
Turkey	—	—	1,003	1,120	—	—	6,318	5,467	—	12,260
Algeria . . . . .	...	0	...	2,773	...	0	...	20,027	7	36,506
Egypt	—	—	...	1,142	—	—	(1) 5,564	5,875	—	12,081
French Morocco	—	—	...	507	—	—	...	2,551	—	5,234
Tunisia . . . . .	...	0	...	410	(3) 2	7	(3) 922	1,713	11	4,310
Union of South Afr. . . . .	...	2	...	2,723	(2) 79	11	(2) 14,890	18,583	24	33,193
Australia . . . . .	...	11	...	223	(2) 46	60	(2) 1,852	1,594	106	4,506
New Zealand . . . . .	...	0	...	20	(3) 0	0	(3) 185	291	0	569
Totals	—	329,674	—	326,786	—	1,859,207	—	1,914,158	3,830,935	3,833,292

(1) Up to November 30. — (2) Up to October 31. — (3) Up to September 30. — (4) Up to August 31. — (5) Up to July 31. — (6) Up to May 31. — (7) Up to March 31. — (8) Up to December 31, 1938. — (9) (10) (11) See notes (8) (9) (10) of the table for Tea.

STOCKS**Total wheat in the United States ⁽¹⁾**

LOCATION	First day of month				
	January 1940	October 1939	January 1939	January 1938	January 1937
	thousand cents				
On farms	143 391	199 328	168,053	125 106	76,988
In interior mills and elevators	77 308	97 525	82 258	68,010	46 172
Commercial wheat in store	79 705	97 227	77 249	56 712	37,420
In merchant mills and elevators ⁽²⁾	60 101	71 218	56,051	59 347	58,741
Stored for others in merchant mills ⁽²⁾	8 437	11,182	8 572	9 994	2,959
<i>Total U S wheat as grain</i>	<i>368,942</i>	<i>475 480</i>	<i>392,183</i>	<i>319 169</i>	<i>222,780</i>
Flour (in terms of grain) in merchant mills ⁽²⁾	15 736	12,357	13 048	13 855	14,179
<i>Total U S wheat</i>	<i>384 678</i>	<i>488 837</i>	<i>405,231</i>	<i>333 024</i>	<i>233,459</i>
Canadian wheat in store in bond in the U S	23 270	6 886	4 725	2 869	15 073
Total wheat in the U. S.	407,948	495,723	409,956	335,893	251,532

⁽¹⁾ Incomplete data wheat in transit is not included, wheat-flour only if in mills — ⁽²⁾ The figures of the partial quarterly census taken by the Bureau of Census (see next table) have been adjusted to allow for stocks in all mills

Wheat and wheat-flour held by commercial mills in the United States ⁽¹⁾.

LOCATION	Last day of month				
	December 1939	September 1939	December 1938	December 1937	December 1936
	thousand cents				
Wheat stocks the property of commercial millers					
Wheat held in mills and mill elevators attached to mills	55 594	65,947	52 296	55,074	54,746
Wheat in other elevators ⁽²⁾	17 781	17 588	17 923	17 294	18,383
Wheat in transit to merchant mills and bought to arrive ⁽²⁾	8,639	10 522	7 468	6 402	7 984
<i>Total</i>	<i>81,514</i>	<i>94,057</i>	<i>77 687</i>	<i>78 770</i>	<i>81,113</i>
Wheat flour in mills and warehouses, and in transit, sold and unsold	10 123	7,954	8 461	8 938	9,185
Wheat stored for others in mills and mill-elevators	7,804	10 354	7 998	9,274	2,757
Grand total ⁽⁴⁾	103,883	115,855	97,858	100,903	97,086

⁽¹⁾ Partial census by the Bureau of Census, including mills accounting for over 90% of the total capacity of all commercial mills — ⁽²⁾ In country elevators, in public terminal elevators and in private terminal elevators not attached to mills. — ⁽³⁾ Of the quantities given under this item only about one third are actually in transit — ⁽⁴⁾ Including flour in terms of grain

Commercial cereals in store in Canada and the United States.

PRODUCTS AND LOCATION	Friday or Saturday nearest 1st of month ⁽¹⁾				
	February 1940	January 1940	December 1939	February 1939	February 1938
	thousand cents				
WHEAT:					
Canadian in Canada . . . . .	...	186,513	189,178	90,226	29,597
U. S. in Canada . . . . .	...	488	488	151	859
U. S. in the United States	71,401	79,705	85,192	65,362	45,717
Canadian in the United States	20,551	23,270	20,636	3,776	1,729
TOTAL . . . . .	...	289,976	295,494	159,515	77,902
RYE:					
Canadian in Canada . . . . .	...	1,359	1,243	1,176	725
U. S. in Canada . . . . .	...	13	13	13	330
U. S. in the United States	5,719	5,902	5,574	4,551	2,461
Canadian in the United States	506	409	528	0	0
TOTAL . . . . .	...	7,683	7,358	5,740	3,516
BARLEY:					
Canadian in Canada . . . . .	...	3,485	3,501	3,151	4,552
U. S. in Canada . . . . .	...	2	2	0	0
U. S. in the United States	8,320	8,935	9,651	6,601	5,668
Canadian in the United States	1,003	1,141	735	0	70
TOTAL . . . . .	...	13,563	13,889	9,752	10,290
OATS					
Canadian in Canada . . . . .	...	3,484	3,042	3,012	3,198
U. S. in Canada . . . . .	...	60	68	243	959
U. S. in the United States	2,873	3,857	4,224	4,974	7,937
Canadian in the United States	313	428	374	0	0
TOTAL . . . . .	...	7,829	7,708	8,229	12,094
MAIZE					
U. S. in Canada . . . . .	...	1,656	1,757	2,322	310
Argentine in Canada . . . . .	...	1	0	17	168
South African in Canada . . . . .	...	802	886	278	1,536
Australian in Canada . . . . .	...	0	0	105	0
U. S. in the United States	23,692	25,677	21,393	28,498	22,607
Of other origin in the United States	0	0	0	0	0
TOTAL . . . . .	...	28,136	...	31,220	24,621

(1) Friday for Canada, Saturday for the United States. — (2) Figure for December 8

Commercial cereals ⁽¹⁾ and oilseeds in store in Argentina

PRODUCTS AND LOCATION	First day of month				
	January 1940	December 1939	November 1939	January 1939	January 1938
	thousand cents				
Rye	1,045	966	1,044	742	113
Barley	1,934	475	711	1,089	1,673
Oats	3,522	1,679	2,404	4,269	5,034
Maize in the ports	8,233	7,572	6,268	3,187	1,716
Maize in other positions	4,628	6,788	6,412	5,477	2,294
TOTAL	12,861	14,360	12,680	8,664	4,010
Canaryseed	237	239	267	217	142
Linseed in the ports	1,464	437	1,139	2,350	1,451
Linseed in other positions	2,233	441	497	5,225	3,890
TOTAL	3,697	878	1,636	7,575	5,341
Sunflowerseed	292	434	647	743	—

⁽¹⁾ Figures for wheat in store have been withheld by governmental order.

Wheat and wheat-flour in the Union of South Africa.

LOCATION	Last day of month				
	December 1939	November 1939	October 1939	December 1938	December 1937
	thousand cents				
Wheat held by millers:					
South African	1,469	952	1,089	1,588	3,394
Imported	49	58	46	222	6
Wheat held by co-operatives	695	251	13	1 217	572
TOTAL	2,213	1,261	1,148	3 027	3,972
Wheat-flour and boermeal ⁽¹⁾ held by millers	236	266	261	213	113
Grand total ⁽²⁾	2,540	1,629	1,511	3,316	4,124

(1) 140 lb. of wheat flour or 165 lb. of boermeal correspond to 200 lb. of wheat. — (2) Including flour in terms of grain.

Wheat stocks in Australia on November 30.

Total stocks of wheat and wheat flour (in terms of wheat), as compiled from information given by millers, merchants, railway departments, etc., amounted to 12,360,000 cents at the end of the last agricultural season (November 30, 1939), against 8,053,000, 5,256,000 and 5,014,000 cents at the end of November 1938, 1937 and 1936 respectively.

Stocks in farmers' hands are not included

Imported cereals in Antwerpen.

PRODUCTS AND LOCATION	Last day of month				
	January 1940	December 1939	November 1939	January 1939	January 1938
	thousand cents				
Wheat	1,922	1,531	1,522	646	1,859
Rye	29	4	44	131	45
Barley	214	336	229	216	235
Oats	4	0	0	27	11
Maize	365	256	374	39	399

Cotton stocks on hand in the United States.

LOCATION	Last day of month				
	January 1940	December 1939	November 1939	January 1939	January 1938
	thousand cents				
In consuming establishments	8 736	9 144	8 766	7 998	8 733
In public storage and at compresses	64 975	71 740	76 182	72 723	58 715
TOTAL	73 711	80 884	84 948	80 721	67 448

Cotton stocks at Bombay, Alexandria and Port Sudan

LOCATION	Thursday nearest 1st of month ⁽¹⁾				
	February 1940	January 1940	December 1939	February 1939	February 1938
	thousand cents				
Bombay ⁽¹⁾	3 631	2 490	2 037	3 486	2 826
Alexandria ⁽²⁾		2 788	2 302	3 346	2 570
Port Sudan		236	392	138	168

⁽¹⁾ Stocks held by exporters, dealers, and millers — ⁽²⁾ Quantities consumed in Alexandria or returned to the interior of the country are not included — ⁽³⁾ For Port Sudan the date refers to the 1st day of the preceding month

AUTHORITIES: *East India Cotton Association* and *Cottons Intelligence* and *Mineral*

PRICES OF AGRICULTURAL PRODUCTS IN GERMANY

The agricultural organization of Germany has for some years included measures of price regulation and a complete system was in practice before the outbreak of the war. The following information thus relates mainly to the state of affairs before hostilities for few substantial modifications have been introduced.

Cereals. — The following information was given in the Crop Report of July 1939:—

An Order of the Reichskommissar for Prices and the Minister of Food and Agriculture, issued on June 30, 1939 (1), fixes growers' prices for home-grown cereals for the year 1939-40. The division of the country into price regions (*Preisgebiete*) for each cereal remains unchanged. For each region a similar scale of prices has been fixed rising from a minimum at the beginning of the season to a maximum at the close. Basic prices are the same as last year for wheat and rye and differ only slightly for fodder oats and barley. The monthly increases have been slightly modified to make them more regular.

We reproduce below the prices in RM per 100 kilograms, for the region which includes Berlin:

PERIODS	WHEAT		RYE		FODDER BARLEY		FODDER OATS	
	1938-39	1939-40	1938-39	1939-40	1938-39	1939-40	1938-39	1939-40
July, 1st half	—	—	17.70	17.70 ¹⁾	16.00	16.20	—	—
July, 2d half	19.40	19.40	17.70	17.70 ¹⁾	16.50	16.20	—	—
August, 1st half	19.70	19.60	17.90	17.90	16.50	16.40 ¹⁾	16.60	—
August, 2d half	19.70	19.60	17.90	17.90	16.50	16.40 ¹⁾	17.10	16.90
September	19.90	19.80	18.10	18.10	16.70	16.60	17.20	17.00
October	20.10	20.00	18.30	18.30	16.90	16.80	17.30	17.10
November	20.30	20.20	18.50	18.50	17.00	17.00	17.40	17.20
December	20.50	20.40	18.70	18.70	17.20	17.20	17.50	17.30
January	20.70	20.60	18.90	18.90	17.30	17.40	17.60	17.40
February	20.90	20.80	19.20	19.10	17.40	17.60	17.70	17.50
March	21.10	21.00	19.40	19.30	17.40	17.70	17.80	17.60
April	21.30	21.20	19.60	19.50 ¹⁾	17.40	17.80	17.90	17.70
May	21.40	21.40	19.70	19.70	17.40	17.90	18.00	17.80
June	21.40	21.60	19.70	19.90	17.40	18.00	18.10	17.90
July, 1st half	21.40	21.80	—	—	—	—	18.10	17.90
July, 2d half	—	—	—	—	—	—	18.10	17.90
August, 1st half	—	—	—	—	—	—	18.10	17.90

(1) As from 1st to 9th, and 10th to 31st respectively.

Potatoes. — A number of orders issued by the Central Potato Association (*Hauptvereinigung der Deutschen Kartoffelwirtschaft*) have laid down the prices to be received by growers for various varieties of potatoes for human con-

(1) Published in the Reichsgesetzblatt I, July 7, 1939.

sumption. The first prices, which were in force only for short periods, related to early potatoes. They were applied on June 16 and 17, 1939, for white, red or blue potatoes and amounted to RM 6.70 per 100 kg. They fell rapidly to RM 2.75 (August 21 to 25). These prices and those of August 28 to 31, which were for potatoes other than early (red, white and blue varieties RM 2.60 per 50 kg.) were applied in all parts of the country. From September 1, regional 50 kg. prices were established. The new prices for the Kurmark region (i.e. the Berlin area) are as follows in RM per 50 kg.

	White, red and blue varieties	Yellow varieties
September, October, November 1939	2.15	2.45
December 1939	2.25	2.55
January 1940	2.35	2.65
February 1940	2.45	2.75
March, April 1940	2.60	2.90
May 1940	2.70	3.00
June, July, August 1940	2.85	3.15

Elsewhere prices are RM 0.05 to 0.25 higher.

Hops. — Maximum and minimum prices are fixed yearly by the Central Brewing Association (Hauptvereinigung der Deutschen Brauwirtschaft). Prices for 1939-40, unlike those of earlier years, do not include the tax in favour of hop marketing. If this tax, which is equivalent to 20 per cent. of the purchase price, is allowed for, the 1939-40 prices are practically equal to those of earlier years in which the tax was included.

The prices of the two years are as follows:—

	Price in RM per 50 kg.	
	Territory I	Territory II
1938 crop (including tax)	200-300	170-300
1939 crop (excluding tax)	160-240	136-240

The prices given in our Crop Report's quarterly review of Prices by Countries contain the tax in all cases.

Meat animals. — The central German Stockraising Association (Hauptvereinigung der Deutschen Viehwirtschaft) has fixed prices for each species and for each of the qualities (which are indicated by letter). Additions and reductions are provided for at different periods of the year. The following are the price margins (in RM per 50 kg.) ruling at Berlin for species and qualities given in the quarterly review of Prices by Countries and, in as far as cattle and pigs are concerned, in the International Yearbook of Agricultural Statistics.

CLASSIFICATION	1940 (1)		1939 (1)	
	Min	Max	Min	Max
Fat cattle (qualities <i>a</i> and <i>b</i>)	38,50	45,50	38,50	45 50
Calves (good average quality <i>b</i> , <i>c</i> and <i>d</i>)	—	57,00	—	57 00
Pigs 100 to 119 5 kg (quality <i>c</i>)	51,50	52,50	49,50	50 50

(1) For 1940, see order of December 23, 1939 (Verkundungsblatt des Reichsnährstandes, No. 119 120, 1939) and for 1939 order of December 21 1938 (Verkundungsblatt des Reichsnährstandes, No. 92 93, 1938).

The following table shows the supplements (+) and reductions (-) in effect during certain periods of the year. No change is allowed for calves. For pigs, a modification in the scale was made during the year.

CATTLE	RM	PIGS	RM
January 30-April 30, 1939	1 00	January 2-May 28, 1939	0 50
July 31-December 3, 1939	+ 1,00	July 17-September 3, 1939	+ 3 00
January 2-April 27, 1940	1 00	September 4-December 31, 1939	+ 2,00
July 28-November 30, 1940	+ 1,00	January 1-May 21, 1940	- 0 50
		July 13-August 30, 1940	3,00
		August 31-October 5, 1940	+ 2,00

A comparison between the price margins including the increases and decreases and the prices actually paid, shows that in nearly all cases in each category the latter correspond to the maxima.

Butter. — The latest prices for different categories of buyers were fixed by an order of October 12, 1938. These are prices between producer and wholesale merchant (in RM per 50 kg., free at producer's station, packing included),

	Wholesale Price		Price between wholesaler and retailer	Consumer Price
	Before October 15 1938	As from October 15 1938		
	per 50 kg.			per ½ kg.
With quality mark (Deutsche Markenbutter)	133	137	1 46	1 60
Creamery, fine quality	130	134	1 43	1 57
Creamery	126	130	1 39	1 53
Farm	118	120	1 28	1 42
Kitchen butter (Kochbutter)	110	114	1 22	1 34

between wholesale merchant and retailer (in RM per $\frac{1}{2}$ kg. free at buyer's station in barrel of 50 kg.) and consumer's prices (in RM per $\frac{1}{2}$ kg.). These are reproduced below. Wholesale prices are compared with those fixed in 1934 and increased, in the case of creamery butter, as from January 1936, by 3 RM per 50 kg. to cover the expenses of the factories incurred in transport to the station.

Cheese. -- A decision of the Bavarian Ministry of Economic Affairs of June 9, 1939, published in the *Marktbericht des Reichsnährstandes* (Ausgabe G) of July 20, authorized an increase in the maximum prices to producers of Allgäu Emmenthal with 45 per cent. fat content. The prices free at producer's station, excluding packing are thus as follows (in RM per 50 kg.):

Emmenthal, with quality mark	87	84
Emmenthal, 1st quality.	83	80
Emmenthal, 2nd quality	80	77
Emmenthal, 3rd quality	77	74

The stipulation that prices, in the case of delivery of matured cheese, may be increased by a maximum of RM 3 per 50 kg. remains in force.

The normal price of soft cheese with 20 per cent. of fat content remains unchanged at RM 29 per 50 kg.

Eggs. -- The prices of eggs were revised as from June 11, 1939 in the old territory of the Reich. There are three principal categories of prices: (a) fixed selling prices per kg. on the farm for ungraded eggs, sold by farmers to whole sale merchants and other distributors; (b) fixed buying prices per egg of graded eggs, for purchase by wholesale distributors, f.o.r., tax paid, packing and marking included; (c) maximum retail prices per egg of graded eggs. The prices of categories (a) and (b) were fixed by the chief of the Farmers of the Reich (Reichsbauernführer) ⁽¹⁾, those of category (c) by the Reich Commissar for the control of prices ⁽²⁾. Separate prices to farmers were fixed for each of the 17 territories into which Germany is divided for the purpose of the economic organization of egg production and trade. Trading prices are uniform for all parts of the Reich within the 1937 frontiers. There are in each case two scales of prices, a summer scale and a winter scale. Summer for this purpose is taken:

in the case of (a) as from January 23 to November 15,

in the case of (b) as from January 26 to November 15,

in the case of (c) as from February 1 to November 15,

the winter in being each case the remainder of the year.

Prices to farmers. -- The summer price varies from RM 1.48 (East Prussia) to RM 1.67 (Rhineland); in the environs of Berlin (Kurmark) it is RM 1.50. The corresponding winter prices are respectively RM 1.84, 2.00 and 1.85.

(1) Published in the *Verkundungsblatt des Reichsnährstandes*, No. 46, June 10, 1939

(2) Published in the *Reichsgesetzblatt*, No. 103, June 10, 1939.

Prices paid by wholesalers distributors. — Eggs are graded into two principal qualities: new-laid and fresh, indicated by G I and G II respectively; in addition there are inferior quality, ex-grade eggs. Each quality is also graded by size: S (Sonderklasse) comprises eggs weighing over 65 grammes, A eggs from 60 to 65 gr., B from 55 to 60 gr., C from 50 to 55 gr. and D from 45 to 50 gr. Eggs weighing under 45 gr. and those of 45 gr. or over of inferior quality are classed as ex-grade. The following table of prices is in RM per 100 eggs.

GRADE ACCORDING TO SIZE	Quality G I		Quality G II	
	Summer	Winter	Summer	Winter
S	11 50	13 50	11 25	13 25
A	11 00	13 00	10 75	12 75
B	10 50	12 50	10 25	12 25
C	9 75	11 75	9 50	11 50
D	9 00	11 00	8 75	10 75

Retail prices. — The quality- and size grades are the same as in the case of purchase by wholesalers. Prices are as follows (in Rpf per egg):

GRADE ACCORDING TO SIZE	Quality G I		Quality G II	
	Summer	Winter	Summer	Winter
S	13	15	12 1/4	14 1/4
A	12 1/2	14 1/2	12 1/4	14 1/4
B	12	14	11 1/4	13 1/4
C	11 1/4	13 1/4	11	13
D	10 1/2	12 1/2	10 1/4	12 1/4

The prices are different from those formerly in force as from November 16, 1938, when there were two principal periods (spring and summer from April 1 to July 31 and winter from November 16 to January 31) and two transition periods (August 1 to November 15 and February 1 to March 31). For grade G I B the prices of which are published in the quarterly review of Prices by Countries and in the International Yearbook of Agricultural Statistics, quotations during the different periods for purchase by wholesalers were:

Spring and summer	RM 8.50 per hundred
Transition periods	„ 10.50 „ „
Winter	„ 12.50 „ „

The proportionate differences between this grade and the others were the same as under the new regulations; retail prices were, as now, Rpf 1 1/2 per egg higher than those given above.

The prices of *imported* eggs are not altered by the new regulations. The system of grading by size is the same as for home-produced eggs, but there is no distinction on the basis of freshness. Prices are fixed for periods different from those adopted for home-produced eggs, as is shown in the following table, which gives the prices to be paid by wholesale distributors, in RM per hundred.

CLASSIFICATION	Prices from March 23 to July 31	Prices from August 1 to March 22
S	9 00	11 00
A	8 50	10 50
B	8 00	10 00
C	7 25	9 25
D	6 50	8 50
Bulgarian and Polish	7 50	9 50

The spring-summer period from March 23 to July 31 has as its counterpart, in retail trading, a period from April 1 to July 31, the remainder of the year being, in either case, the transition period. Maximum retail prices are in each case R Pf 1 $\frac{1}{2}$ per egg higher than those given above.

Finally there are the prices of *preserved or refrigerated* eggs. These eggs, which are only sold during the transition period, cost in each grade RM 1 less per hundred wholesale and R Pf 1 less per egg retail than imported eggs during this period.

In the *Ostmark* prices to be paid to farmers and purchase prices to be paid by wholesalers distributors are drawn up on the same scale as in the old territory of the Reich. There is, however, in the system of grading for sale to wholesale distributors, a further category of ungraded but not inferior eggs, as are those of the ex-grade quality. Prices to be paid by wholesale distributors for eggs of category G I B were RM 8.70 per hundred from March 23 to June 17, 1939 and RM 10.70 as from June 18.

In *Sudetenland* there is no difference to note from either the system or the prices in force in the old Reich, except that here, as in the *Ostmark*, there exists the category of ungraded eggs.

J.P.v.A.

PRICES**PRICES BY PRODUCTS (1)**

All quotations are spot, on Fridays, unless otherwise stated. The monthly averages are based on the Friday quotations, and the yearly averages on the monthly.

DESCRIPTION	Feb.	Feb	Jan.	Jan.	AVERAGE					Commercial Season (2)	
	9	2	26	19	Jan	Feb	Feb.				
	1940	1940	1940	1940	1940	1930	1938	1938-39	1937-38		
Wheat											
Budapest: Tisza wheat, 78 kg. per hl (pengo per quintal)	20 65	20.65	20.55	20.55	20.55	20.61	20.88	20.42	21.44		
Braila: Home-grown, good qual. (lei p. ql.)	480	480	n. 450	450	460	440	536	411	520		
Winnipeg: No. 1 Manitoba (cents p. 60 lb.)	82 1/8	80 7/8	82	83 1/4	82 1/2	60 3/8	144 1/2	62	131 1/4		
Chicago: No. 2 Hard Winter (cents p. 60 lb.)	102	100 1/4	102	104 1/4	103 1/2	71 7/8	102	70 1/4	96 1/4		
Minneapolis (cents per 60 lb.):											
No. 1 Northern	101	98 1/2	100 7/8	103 1/8	102 3/8	75 1/4	110	74 3/8	104 3/8		
No. 2 Amber Durum	89 3/8	86 3/8	87 3/4	90 1/2	89 7/8	68 7/8	99 3/8	68 3/4	93 3/4		
New York: No. 2 Hard Winter (f.o.b. cents per 60 lb.)	122 1/2	119 7/8	121 1/8	123 3/8	123 1/4	82 3/8	118	84 3/4	112 7/8		
Buenos Aires (4): No. 2 Hard, 80 kg. per hl. (paper pesos per quintal)	7.20	7.45	7.65	7.95	8.00	7.00	12 10	6.89	12.20		
Karachi: White Karachi, 2% barley, 1 1/2% impurities (rupees per 656 lb.)	29- 6- 0	29- 8- 0	29-10- 0	29- 8- 0	30-14- 0	24- 5- 0	27- 5- 0	22-12- 8	26-15- 9		
Antwerpen (francs per quintal):											
Home-grown	150.00	149.00	147.00	148 00	147.75	120 75	136.00	123 75	135.05		
No. 1 Manitoba (Atlantic; c.i.f., arrived)	145.00	141.00	144.00	146 00	149.75	93.10	195.75	96 25	171.20		
Bahia (c.i.f., arrived)	142.00	137.50	138.00	139 00	141.25	75.75	149.00	79.00	142.10		
London, Mark Lane: English (sh. per 504 lb.; at farm)	31/6	31/6	31/6	31/6	31/6	18/7 1/2	36/1 1/2	20/7 1/4	37/7 1/2		
London, Baltic (f.o.b. parcels; sh. per 480 lb.):											
No. 1 Northern Manitoba (St. John)	35/9	35/-	35/9	36/1 1/2	36/0 1/4	—	—	—	—		
No. 1 Northern Manitoba (Pacific)	29/6	29/-	29/10 1/2	30/3	30/1 1/4	—	—	—	—		
Argentine	n. q.	25/6	26/-	27/-	26/11	—	—	—	—		
Australian	26/-	26/-	26/-	26/3	26/2 1/4	—	—	—	—		
Rye.											
Budapest: Pest rye (pengo p. quintal)	16 12	16.12	15.82	15.82	15.82	13 91	18.61	14.34	18 57		
Winnipeg: No. 2 rye (cents p. 56 lb.)	71 1/8	70 7/8	75	76 1/8	74 1/4	41	82 1/4	40 1/4	72 1/4		
Minneapolis: No. 2 rye (cents p. 56 lb.)	65 1/8	64 1/8	68 1/8	69 1/8	68 7/8	44 1/4	75 7/8	44	67 1/4		
Antwerpen (francs per quintal):											
Home-grown	130.00	134.00	131.00	n. q.	n. q.	n. q.	126.75	n. q.	124 85		
Danubian (c.i.f., arrived)	n. q.	n. q.	n. q.	n. q.	n. q.	83.50	125.60	81.80	123.30		
Soviet (c.i.f., arrived)	127.50	128.00	126.50	125.00	129.35	62.10	118 95	61.15	112.50		
Plata (c.i.f., arrived)	126.00	125.00	124.00	123.00	127.25	82 75	126.25	80.80	124.55		
Barley.											
Braila: Average quality (lei p. quintal)	415	430	425	n. 420	420	380	n. 376	338	365		
Winnipeg: No. 4 West. (cents p. 48 lb.) (*)	43 1/2	43 1/2	44	45	48 1/4	35 1/4	62 3/4	34 1/4	56 1/4		
Chicago: Feeding (on sample; cents p. 48 lb.)	43 1/2	43 1/2	44	45	44 1/4	38 1/2	56 1/4	40 1/4	51 1/4		
Minneapolis: No. 2 Feeding (cents p. 48 lb.)	48	48	49	49	48 1/4	42	61 1/4	40 7/8	53 1/4		
Antwerpen (c.i.f., arrived; frs. per ql):											
Danubian	130.00	126.00	128.00	129.00	132.25	73.75	109.00	75.45	106.10		
No. 2 Federal (*)	n. q.	n. q.	n. q.	n. q.	n. q.	72.25	106.60	71.40	100.80		
Plata, 64/65 kg. per hl	127.00	128.50	129.00	130.00	135.25	69.35	109.25	74.20	106.80		
London, Mark Lane: English malting (sh. per 48 lb.; at farm)	72/6	72/6	72/6	72/6	73/9	35/-	52/2 1/4	36/1	53/-		
London, Baltic (f.o.b. St. John, parcels; sh. per 400 lb.):											
No. 1 Canadian Feed	n. q.	n. q.	n. q.	n. q.	n. q.	—	—	—	—		
No. 3 Canadian 6-row	26/3	25/3	25/10	26 1/2	26 1/4	—	—	—	—		
La Plata	16/6	17/-	18/3	18/3	—	—	—	—	—		

* Indicates that the product was not quoted during part of the period under review. — n. q. = not quoted. — n. = nominal. — (n) Thursday prices.

(1) In relation to Government price fixing, numerous series are omitted from this table; notes concerning them are given on p. 1060 of the Nov. 1939 Crop Report for the United Kingdom, on p. 1163 of the Dec. 1939 issue for Italy and on p. 14 of the present issue for Germany; further notes will be published in future Crop Reports. — (*) August-July. — (1) As from Sept. 22, 1939: No. 2 Feeding barley. — (1) As from Sept. 23, 1938: No. 3 Federal. — (1) Dec. 29: 92 1/4; average Dec.: 88. — (1) Shipping Halifax. — (1) Shipping Feb. 1-15. — (1) Shipping Feb., 64 lb. per bushel. — (1) Dec. 29: 78 1/4; average Dec.: 72. — (1) Dec. 29: 71 1/8; average Dec.: 65. — (11) Dec. 29: 47 1/2; average Dec.: 46. — (12) Shipping Feb.

DESCRIPTION	Feb.	Feb.	Jan.	Jan.	AVERAGE			
	9	2	26	19	Jan.	Feb.	Feb.	Commercial
	1940	1940	1940	1940	1940	1939	1938	Season ¹⁾
								1938-39 1937-38
Oats.								
Winnipeg: No. 2 White (cents per 34 lb.)	42 ^a / ₄	43 ¹ / ₄	43 ¹ / ₄	42 ¹ / ₄	^{a)} 42 ¹ / ₄	28 ¹ / ₄	57	29 50 ¹ / ₄
Chicago: No. 2 White (cents per 32 lb.)	44	42 ¹ / ₄	42 ¹ / ₄	43 ¹ / ₄	43 ¹ / ₄	32	33 ¹ / ₄	30 ¹ / ₄ 32 ¹ / ₄
Buenos Aires (a): No. 2 White, 40 kg. per hl. (paper pesos p. quintal)	5.10	5.10	5.30	5.25	5.26	4.37	6.87	4.81 6.32
London, Mark Lane: English white (sh. per 336 lb.; at farm)	^{a)} 45/-	^{a)} 45/-	^{a)} 45/-	^{a)} 45/-	—	19/3	26/9	19/3 ¹ / ₄ 26/6 ¹ / ₄
London, Baltic (f.o.b. St. John, parcels; sh. per 320 lb.):								
No. 1 Canadian feeding	n. q.	^{a)} 16/6	¹⁾ 21/6	n. q.	^{a)} 22/4 ¹ / ₄	—	—	— —
No. 2 Canadian Western	24/1 ¹ / ₄	23/7 ¹ / ₄	¹⁾ 24/6	¹⁾ 24/1 ¹ / ₄	24/3 ¹ / ₄	—	—	— —
Milano (b) (lire per quintal):								
Home-grown	147.50	147.50	147.50	147.50	147.50	97.75	100.75	98.00 100.05
Foreign	n. q.	n. q.	n. q.	n. q.	n. q.	95.50	96.50	95.90 97.15
Maize.								
Braila: Average quality (lei p. quintal)	n. 345	n. 345	n. 345	n. 345	341	394	295	362 ^a 313
Chicago: No. 3 Yellow (cents p. 56 lb.)	58	56 ¹ / ₄	58 ¹ / ₄	59 ¹ / ₄	58 ¹ / ₄	48 ¹ / ₄	57 ¹ / ₄	51 ¹ / ₄ 83
Buenos Aires (a): Yellow Plata (paper pesos per quintal)	5.45	5.10	5.60	5.90	6.21	6.60	9.49	6.89 7.79
Antwerpen (c. i. f., arrived; francs p. ql.):								
Bessarabian	n. q.	n. q.	n. q.	n. q.	n. q.	81.75	n. q.	87.90 n. q.
Yellow Plata	123.00	123.00	123.50	123.50	125.25	82.00	110.95	90.20 101.00
Cinquantino (Argentine "Cuarentino")	131.00	134.00	134.00	135.00	136.35	106.25	116.50	118.05 109.05
London, Baltic (f.o.b., parcels; sh. per 480 lb.):								
No. 2 Yellow American (Baltimore)	29.10 ¹ / ₄	29/7 ¹ / ₄	¹⁾ 30/1 ¹ / ₄	^{a)} 30/6	^{a)} 30/6 ¹ / ₄	—	—	— —
Yellow Plata	18/ 9	18/3	¹⁾ 19/7 ¹ / ₄	¹⁾ 20/9	21/8 ¹ / ₄	—	—	— —
No. 2 White flat African	n. q.	n. q.	n. q.	n. q.	^{a)} 20/9	—	—	— —
Rice (milled).								
								1939 1938
Rangoon (delivery current month, rupees per 7500 lb.):								
No. 2 Europe (Burma)	290-0	285-0	285-0	290-0	288-12	211-14	233- 0	255- 2 255-12
Kanungtoe, small mills specials	264-0	257-8	252-8	262-0	260-14	195-10	205- 8	231- 9 219-12
Big mills specials	250-0	247-8	242-8	250-0	250-10	193- 8	193-12	226-14 207- 0
Salgon (Indochinese piastres p. quintal):								
No. 1 Round white, 25 % broken	...	...	...	...	...	9.17	9.59	9.26 10.66
No. 2 Japan, 40 % broken	...	...	...	...	...	8.80	9.25	8.54 10.11
London (a) shipping current or following month; sh. p. cwt.):								
No. 2 Burma (f.o.b. Rangoon) (^a)	^{a)} 14/6	^{a)} 14/-	8 4 ¹ / ₄	8 4 ¹ / ₄	¹⁰⁾ 8/4	—	—	— —
No. 1 Saigon (f.o.b. Saigon)	9/1 ¹ / ₄	9/1 ¹ / ₄	9 4 ¹ / ₄	9/3	¹¹⁾ 9/1 ¹ / ₄	—	—	— —
Siam Super (f.o.b. Bangkok) (^a)	9/1 ¹ / ₄	9/-	9 7 ¹ / ₄	10/3	¹²⁾ 9/6 ¹ / ₄	—	—	— —
Tokyo: "Tyumal", brown Japanese, average quality (yens per koku)	...	...	...	...	¹³⁾ ...	35 17	33.23	37.27 34.26
Linseed.								
Buenos Aires (a): Current quality, 4 % impurities (paper pesos p. quintal)	16.35	16.40	16.70	17.10	16.95	13.34	15.71	15.12 14.31
Bombay: Bold (rupees per cwt.)	9-8-0	9-7-6	10-4-0	10-14-0	11-2-0	7-2-1	7-12-1	7-12-7 7-4-10
Antwerpen: Plata (c. i. f., arrived; frs. per quintal)	n. 228.00	n. 228.00	n. 235.00	n. 238.00	n. 246.00	147.75	179.85	182.50 166.20
London (c. i. f., shipping current or following month; £ per long ton):								
La Plata	¹⁴⁾ 15-5-0	¹¹⁾ 15-8-9	¹⁴⁾ 15-10-0	¹¹⁾ 15-16-3	¹⁴⁾ 15-17-10	10-17-2	12-10-7	¹²⁾ 12- 2-3 11-10-11
Bombay	20-10-0	20-15-0	21- 5-0	22-7-6	22- 3-9	13- 2-2	14-11-10	¹⁴⁾ 14-10-3 13- 3- 9
Duluth: No. 1 Northern (futures; cents per 56 lb.) (^a)	201 ¹ / ₄	194 ¹ / ₄	204 ¹ / ₄	207	206 ¹ / ₄	176 ¹ / ₄	204 ¹ / ₄	172 ¹ / ₄ 183 ¹ / ₄
Minneapolis: No. 1 Northern (cts. p. 56 lb.)	215	207 ¹ / ₄	216	219	¹⁵⁾ 217	184 ¹ / ₄	212	180 190

* Indicates that the product was not quoted during part of the period under review. — n. q. = not quoted. — n. = nominal. — (a) Thursday prices. — (b) Saturday prices.

(¹⁾ Oats: August-July; maize: May-April. — (²) London Standard. — (³) Quotations refer to May futures from January to May, to July futures in June and July, to September futures in August and September, and to December futures during the other months. — (⁴) Dec. 29: 41 ¹/₄; average Dec.: 38 ¹/₄. — (⁵) Seed oats. — (⁶) Shipping Vancouver. — (⁷) Shipping Feb. — (⁸) Shipping St. John. — (⁹) C. i. f. price. — (¹⁰) Jan. 11: 8/4 ¹/₄; Jan. 4: 8/3. — (¹¹) Jan. 11: 8/10 ¹/₄; Jan. 4: 9/1 ¹/₄. — (¹²) Jan. 11: 9/6; Jan. 4: 8/10 ¹/₄. — (¹³) From Nov. 10 1939 to Jan. 12 1940: 43-30. — (¹⁴) New crop. — (¹⁵) Dec. 29: 217 ¹/₄; average Dec.: 204 ¹/₄.

DESCRIPTION	Feb	Feb.	Jan.	Jan.	Average					
	9	2	26	19	Jan.	Feb.	Feb.	Commercial		
	1940	1940	1940	1940	1940	1939	1938	Season (1)	1938-39	1937-38
Cottonseed.										
Alexandria (a) (piastres per ardeb):										
Upper Egyptian . . . . .	...	65.7	67.8	67.7	68.6	62.5	57.3	57.7	55.3	
Sakellariis . . . . .	..	64.2	66.3	66.2	67.0	58.8	52.8	54.3	50.7	
London: Egyptian (c.i.f., shipping current or following month; £ per long ton)	*) 7 13-9	*) 7-15-0	n. 8-1-3	7-15-0	8-0-0	6-10-7	6-4-4	6-3-5	6-1-6	
Cotton.										
New Orleans: Middling (cents p. lb.). .	n. 10.72	n. 10.40	n. 10.42	n. 10.82	n. 10.78	8 60	9.07	8.75	8.87	
New York: Middling (cents per lb.). .	n. 11.12	n. 10.87	n. 10.91	n. 11.24	n. 11.16	8 97	8 91	9.00	8.75	
Bombay (rupees p. 784 lb.):										
Broach, f.g. (futures) (1)	273-0	274-0	272-0	290-0	299-8	150-8	176-10	156-2	166-11	
Broach, t.g. (spot)	265-0	265-0	278-0	n. q.	n. q.	n. q.	n. q.	* 156-6	* 162-9	
Oomra, fine (spot)	238-0	239-0	248-0	263-0	269-4	141-8	160-12	* 148-12	* 148-13	
Alexandria (a) (talaris per kantar):										
Sakellariis, f.g.f. . . . .	...	20.35	20.65	21.05	21.31	12.22	14.30	12.37	14.19	
Giza 7, f.g.f. . . . .	...	17.87	18.17	18.62	18.56	11.81	13.30	12.34	12.81	
Ashmuni, f.g.f. . . . .	...	17.37	17.87	18.32	18.29	10.02	10.86	10.16	10.62	
Liverpool (pence per lb.):										
Middling, super good	n. 8.90	n. 8.89	n. 8.90	n. 9.35	n. 9.43	5.83	5.88	5.88	5.79	
Middling	8.30	8.29	8.30	8.75	8.83	5.13	5.08	5.17	4.97	
São Paulo, g.f.	n. 8.60	n. 8.49	n. 8.55	n. 8.95	n. 9.02	5.13	5.33	5.14	5.16	
Broach, good staple, f.g. (1)	n. 7.38	n. 7.40	n. 7.47	n. 7.87	n. 7.91	3.86	4.17	* 3.92	n. 4.04	
C.P. Oomra good staple, superfine (1) .	n. 7.40	n. 7.51	n. 7.58	n. 7.98	n. 8.06	4.04	4.44	4.11	4.29	
Giza 7, f.g.f.	10.63	10.81	10.59	10.77	10.86	7.09	7.62	7.22	7.42	
Upper Egyptian, f.g.f.	10.20	10.31	10.10	10.41	10.44	5.92	6.30	6.00	6.31	
Butter.										
Köbenhavn (a): Danish, for export (crs per quintal)	286 00	286.00	286.00	286.00	285.50	265 00	224 00	239.00	230 49	
Leeuwarden, Commission for butter quotations (a): Dutch, for export (cents per kg) (1)	81	82	82	82	81 1/4	85 1/4	81	77 1/4	80 1/4	
Antwerpen, auction: Belgian (frs. p. kg.)	25.10	25 00	24.80	22.65	24.55	25 30	26.25	20.70	23.30	
New York (b) 92 score, creamery (cents per lb.) . . . . .	...	..	33	32	*) 32	26 1/4	31	26 1/8	28	
Cheese.										
Roma: Roman Pecorino, choice (lire per quintal)	1,167.50	1,167.50	1,167.50	1,167.50	1,167.50	1,100.00	1,025.00	1,110.25	1,058.30	
Alkmaar: Edam 40+, National Mark, factory cheese, small (florins p. 50 kg.)	24.00	19.75	21.25	22.00	22.75	19.94	22.19	19.35	21.33	
Gouda: Gouda 45+, National Mark, farm made, 1st quality (florins p. 50 kg.)	31.50	31.75	32.00	32.00	31.75	26.25	26.25	26.52	25.72	
Eggs.										
Antwerpen, auction: Belgian, average quality (frs. per 100)	78.00	69.00	63.00	57.00	61.00	44.50	55.25	56.00	58.80	
Denmark (1): Danish for export (crs. per quintal)	126.00	126.00	126.00	116.00	122.00	88.50	114.00	112.53	116.70	
Apeldoorn (d): Dutch, average quality 57/58 gr. each (fl. per 100) . . . . .	...	...	...	...	...	3.25	3.25	3.85	3.85	
Barneveld (a): Dutch, average quality 57/58 gr. each (fl. per 100) . . . . .	...	...	...	...	...	3.35	3.42	3.94	3.90	

* Indicates that the product was not quoted during part of the period under review. — n. q. = not quoted. — n. = nominal. — (a) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks commencing on Thursdays. — (d) Prices on following Mondays.

(1) Cottonseed: Sept August; cotton: August-July. — (2) Quotations refer to April-May futures during the period September-May following, and to July-August futures during the other months. — (3) As from May 15, 1939: "fair staple". — (4) For home prices these quotations must be increased by a consumption tax which, as from Oct. 19, 1939, amounts to 80 cents per kg. — (5) Shipping March-April. — (6) Jan. 12: 31 1/4.

AVERAGE MONTHLY PRICES IN GOLD FRANCS PER QUINTAL (1)

DESCRIPTION	Jan 1940	Jan 1939	Jan 1938	DESCRIPTION	Jan 1940	Jan 1939	Jan 1938
Wheat.				Rice.			
Winnipeg No 1 Manitoba	8 14	6 69	16 80	Rangoon No 2 Burma	7 83	6 61	7 86
Chicago No 2 Hard Winter	11 64	n 8 10	11 43	Saigon No 1 Round white		6 91	9 28
Buenos Aires No 2 Hard	6 47	6 67	12 46	London No 2 Burma (f o b Rangoon)	9 95	—	—
Karachi White Karachi	9 57	8 95	11 31	Cotton.			
Antwerpen				New Orleans Middling	72 75	58 78	58 58
No 1 Manitoba (Atlantic)	15 54	9 61	20 45	Bombay (futures)			
Bihar	14 66	8 02	16 50	M g Broach, f g	77 67	47 11	56 25
London (f o b)				Alexandria			
No 1 Manitoba (Pacific)	8 40	—	—	Sakellaris, f g f	118 03	79 93	100 23
Argentine	7 50	—	—				
Australian	7 30	—	—				
Rye.				Pork.			
Minneapolis No 2 rye	8 30	5 50	9 04	Denmark (dual weight)	118 40	108 44	117 45
Antwerpen				Rotterdam (live weight)		79 59	102 30
Danubian	n q	8 98	13 41				
Irish	13 20	9 00	13 44				
Barley.				Bacon.			
Winnipeg No 4 Western	5 98	4 90	8 56	London			
Minneapolis No 2 feeding	6 85	5 96	8 54	English No 1 lean sizable		137 15	147 56
Antwerpen Danubian	13 72	8 18	11 68	Danish No 1 sizable		137 15	145 31
London (f o b)				Butter.			
No 1 Canadian feeding	n q	—	—	Copenhagen Danish	169 02	161 87	160 47
Oats.				Leeuwarden Dutch	132 93	139 70	136 39
Winnipeg No 2 White	7 40	5 90	11 24	London			
Chicago No 2 White	9 12	6 88	7 25	Danish		198 69	198 89
Buenos Aires No 2 White	4 25	4 34	6 83	New Zealand salted		171 96	165 63
London (f o b)				Cheese.			
No 1 Canadian feeding	9 35	—	—	Alkmaar Edam 40 +	73 98	66 53	72 46
Malze.				London New Zealand		97 41	101 64
Chicago No 3 Yellow	7 05	6 22	7 14	Eggs (per 100).			
Buenos Aires Yellow Plata	5 02	7 05	10 12	Denmark Danish (per ql)	72 22	72 47	89 59
Antwerpen Yellow Plata	13 00	9 32	11 71	London			
Liverpool and London (f o b)				English		11 44	11 47
Yellow Plata	6 04	—	—	Danish		7 44	8 70
				Dutch		8 71	9 73

(1) Extracts from tables published in the January, April, July and October issues for method of conversion into gold francs per quintal, see those issues, for detailed specification of qualities and conditions, see "Prices by products"

**INDEX-NUMBERS OF PRICES OF AGRICULTURAL PRODUCTS
AND OF COMMODITIES BOUGHT BY THE FARMER**

DESCRIPTION	Jan.	Dec	Nov.	Oct.	Sept.	August	Jan	Jan	YEAR	
	1940	1939	1939	1939	1939	1939	1939	1938	1938-39 (¹)	1937-38 (¹)
Germany										
(Statistisches Reichsamt; products sold by farmers)										
Average for corresponding months 1900-10/1913-14 = 100.										
Cereals	112	113	112	109	108	110	112	112	111	110
Edible potatoes	110	111	108	108	110	134	110	108	116	114
Plant products	112	113	111	109	108	116	112	112	112	111
Meat animals	98	97	96	95	95	97	96	94	97	95
Livestock products (butter and eggs) . .	109	108	106	105	109	114	109	104	111	109
Livestock and livestock products . . .	101	100	99	98	99	102	100	97	101	99
Total agricultural products . . .	104	104	103	102	102	106	103	101	104	102
Germany										
(Statistisches Reichsamt, wholesale products) 1913 = 100										
									1938	1937
Foodstuffs of plant origin	108.2	107.6	107.5	107.5	107.6	108.8	107.8	115.7	105.9	104.6
Fertilizers	54.5	53.5	52.9	52.9	53.7	53.1	56.5	56.8	55.3	57.0
Consumption goods (¹)	137.5	137.0	136.7	136.3	136.2	136.1	135.0	135.5	135.4	133.3
Wholesale products in general . . .	108.2	107.6	107.4	107.1	106.9	107.1	106.5	105.6	105.7	105.9
England and Wales (¹)										
(Ministry of Agriculture and Fisheries) Average 1927-1929 = 100.										
A: UNCORRECTED FOR SEASONAL VARIATION										
Cereals and farm crops . . . . .	...	101	95	91	89	78	79	91	86 1/2	98 1/2
Livestock and livestock products . . .	...	115	107	96	92	87	99	101	88	88
Total agricultural products . . . . .	...	112	105	96	92	85	95	99	90	90 1/2
Wholesale products in general (¹) . .	106.1	103.6	100.4	94.8	90.1	84.1	83.3	92.3	86.9	93.1
B: CORRECTED FOR SEASONAL VARIATION										
Cereals and farm crops . . . . .	...	102	95	90	88	77	80	91	—	—
Livestock and livestock products . . .	...	103	98	92	94	93	90	93	—	—
Total agricultural products . . . . .	...	103	97	91	93	91	89	93	—	—

(¹) Household goods of all kinds, and clothing. — (¹) Index-numbers taking account of payments under the Wheat Act, the Cattle Subsidy Act, and Government payments for milk. — (¹) Index-numbers by the Board of Trade, reduced to 1927-1929 = 100. — (¹) Agricultural year: July 1-June 30.

DESCRIPTION	Jan.	Dec.	Nov.	Oct.	Sept.	August	Jan.	Jan.	YEAR	
	1940	1939	1939	1939	1939	1939	1939	1938	1938	1937
Argentina										
(Banco Central de la Republica Argentina) 1926 = 100.										
Cereals and linseed	79.9	85.0	80.7	80.3	83.9	73.7	77.4	113.8	90.6	101.3
Meat	103.7	105.1	108.9	103.9	92.9	93.7	84.5	99.6	94.8	93.6
Hides and skins	111.3	112.3	103.6	106.8	106.3	76.8	86.6	85.5	81.9	118.6
Wool	141.9	131.8	131.9	135.1	134.5	94.2	86.8	109.3	92.5	143.7
Dairy products	75.7	82.0	87.3	92.2	88.2	84.0	74.0	90.7	83.9	93.7
Forest products	116.6	116.6	109.5	109.5	102.3	101.3	101.6	98.3	100.0	98.6
Total agricultural products	91.0	93.8	90.9	90.7	91.6	79.1	80.4	108.1	90.6	105.1
Non agricultural commodities	134.1	129.1	129.1	126.2	119.3	109.1	109.2	113.4	109.4	114.4
Wholesale products in general	124.9	121.7	121.0	118.7	113.5	102.8	103.1	112.4	105.5	112.6
Australia (Commonwealth)										
(Commonwealth Bureau of Census and Statistics) 1928-29 = 100.										
Agricultural field products	75.3	78.8	...	83.8	78.2	74.8	78.4	89.5	80.3	84.8
Pastoral products	77.8	77.4	...	76.6	72.8	64.1	65.8	71.0	71.4	79.0
Farmyard and dairy products	85.6	85.6	...	85.6	85.2	87.2	87.7	80.6	89.3	82.9
Total agricultural products	78.4	79.4	...	80.7	77.0	72.0	74.2	79.0	77.8	81.7
Belgium										
(Belgische Boerenbond — Boerenbond belge) Average of corresponding months 1909-1914 = 100.										
Field products . . . . .	...	647	608	597	535	436	504	595	541	577
Livestock products . . . . .	...	635	634	634	609	623	687	691	689	617
Total agricultural products . . . . .	...	639	626	622	586	564	629	661	643	604
Rent . . . . .	...	650	650	650	650	650	650	650	650	647
Agricultural wages . . . . .	...	960	950	940	935	930	900	870	887	851
Fertilizers . . . . .	...	512	513	495	466	466	471	464	471	443
Feedingstuffs . . . . .	...	706	637	696	637	470	585	696	631	610
Total production expenses (including those not specified) . . . . .	...	805	788	794	779	746	759	764	757	736
Bohemia										
(Institute for Farm Accounting and Agricultural Economics) 1913-14 = 100										
A: SUGARBEET REGION										
Plant products . . . . .	...	...	...	...	...	649	619	594	584	576
Livestock products . . . . .	...	...	...	...	...	718	562	522	531	550
Total agricultural products . . . . .	...	...	...	...	...	677	595	564	562	565
Total production expenses . . . . .	...	...	...	...	...	877	818	790	801	783
B: NON-SUGARBEET REGION										
Plant products . . . . .	...	...	...	...	...	706	677	653	656	623
Livestock products . . . . .	...	...	...	...	...	704	553	510	504	539
Total agricultural products . . . . .	...	...	...	...	...	705	603	567	565	572
Total production expenses . . . . .	...	...	...	...	...	895	833	798	811	796

(1) July 1-June 30.

DESCRIPTION	Jan.	Dec.	Nov.	Oct.	Sept.	August	Jan.	Jan	YEAR	
	1940	1939	1939	1939	1939	1939	1939	1938	1938	1937
Canada										
(Dominion Bureau of Statistics, Internal Trade Branch) 1926 = 100.										
Field products (grain, etc.) . . . . .	...	...	...	...	...	...	54.7	88.8	69.0	88.3
Livestock and livestock products . . . . .	...	...	...	...	...	...	81.7	82.2	81.3	85.0
Total Canadian farm products . . . . .	...	...	...	...	...	58.4	64.8	86.3	73.6	87.1
Fertilizers . . . . .	...	...	...	...	...	...	82.8	75.2	78.9	74.5
Consumers' goods (other than foodstuffs, beverages and tobacco) . . . . .	...	...	...	...	...	...	76.2	78.0	77.2	78.4
Wholesale products in general. . . . .	...	81.7	80.3	...	...	72.4	73.2	83.8	78.6	84.6
Chili										
(Dirección General de Estadística) 1913 = 100										
Cereals . . . . .	...	...	...	446.2	435.3	433.0	445.9	517.3	551.0	572.3
Other plant products . . . . .	...	...	...	431.0	405.9	410.0	340.4	367.5	375.4	375.3
Meat animals . . . . .	...	...	...	423.3	424.2	398.1	320.5	374.3	380.3	381.2
Meat . . . . .	...	...	...	386.9	289.0	280.6	285.1	331.9	324.7	316.2
Total agricultural products . . . . .	...	...	...	430.5	405.1	403.1	365.1	410.2	424.3	430.0
Domestic industrial products . . . . .	...	...	...	443.4	424.8	424.6	429.0	464.5	472.5	489.4
Wholesale products in general. . . . .	...	...	...	523.3	497.1	489.9	475.1	505.9	510.7	522.6
United States										
(Bureau of Agricultural Economics) Average 1909-10 to 1913 14 = 100.										
A: UNCORRECTED FOR SEASONAL VARIATION										
Cereals	90	87	79	77	83	64	66	91	74	126
Cotton and cottonseed	85	82	75	74	76	71	71	66	70	95
Fruits	66	65	66	73	73	70	76	70	73	122
Meat animals	103	101	107	112	117	101	112	110	114	132
Dairy products	119	118	117	112	107	100	109	128	109	124
Chickens and eggs	91	97	117	108	102	90	97	113	108	111
Miscellaneous	113	104	98	94	98	100	109	114	95	130
Total agricultural products	99	96	97	97	98	88	94	102	95	121
Commodities bought for use in living and production	122	122	122	122	122	119	120	126	123	130
Prices, interest and taxes paid by farmers	128	128	128	128	128	125	126	131	129	135
Agricultural wages (1)	119	—	—	126	—	—	117	118	116	120
B: CORRECTED FOR SEASONAL VARIATION										
Cereals	91	89	82	80	85	64	67	91	—	—
Cotton and cottonseed	88	86	77	75	73	68	73	68	—	—
Fruits	72	73	75	75	75	71	83	78	—	—
Truck crops (market garden crops)	117	96	130	128	114	101	96	105	—	—
Meat animals	106	107	112	113	116	99	116	115	—	—
Dairy products	114	112	113	111	108	104	105	123	—	—
Chickens and eggs	80	76	92	96	101	99	86	101	—	—
Miscellaneous	114	104	95	94	99	93	109	114	—	—
Total agricultural products	100	97	97	96	98	88	95	102	—	—
Agricultural wages	124	—	—	122	—	—	122	123	—	—

(1) 1910-1914 = 100.

DESCRIPTION	Jan 1940	Dec 1939	Nov 1939	Oct 1939	Sept 1939	August 1939	Jan 1939	Jan 1938	YEAR	
									1938	1937
United States										
(Bureau of Labor)										
1926 = 100										
Grains	73.5	71.6	64.1	61.6	65.1	51.5	56.3	75.0	60.6	98.3
Livestock and poultry	67.2	63.8	66.1	70.6	76.3	66.0	78.0	78.5	79.0	95.5
Other farm products	68.6	68.4	68.3	66.1	64.6	60.1	63.2	66.1	63.9	77.2
Total agricultural products	69.1	67.6	67.3	67.1	68.7	61.0	67.2	71.9	68.5	86.4
Agricultural implements	93.4	93.3	93.3	93.4	93.5	93.5	93.4	96.2	95.5	94.0
Fertilizer materials	77.4	74.5	73.0	70.6	69.2	67.2	70.2	72.1	69.2	71.2
Mixed fertilizers	73.5	73.7	72.6	72.6	72.6	72.9	74.8	73.4	72.2	73.2
Cattle feed	93.0	91.7	91.5	82.9		68.4	79.9	91.6	76.9	110.5
Non agricultural commodities	81.5	81.8	81.6	82.0	81.3	77.9	78.9	82.8	80.6	86.2
Wholesale products in general	79.4	79.3	79.2	79.4	79.1	75.0	76.9	80.9	78.6	86.3
Finland										
(Central Bureau of Statistics)										
1935 = 100										
Agricultural products						115	118	120	117	115
Forestry products						169	145	160	145	165
Feedingstuffs						127	123	139	129	133
Fertilizers						107	107	111	109	109
Wholesale products in general						117	113	119	114	122
Hungary										
(Central Royal Bureau of Statistics)										
1929 = 100										
Cereals	88.9	87.7	86.8	85.1	85.0	94.9	85.2	90.4	89.1	88.9
Total raw plant products (1)	88.8	82.5	79.9	80.0	79.6	81.0	76.5	70.9	76.9	69.2
Meat animals, meat and lard	69.0	65.7	66.6	67.9	69.9	67.4	63.9	72.7	68.4	75.5
Total livestock products (1)	71.5	67.7	68.4	66.8	67.4	66.0	64.6	68.0	65.6	68.5
Total agricultural products	83.4	77.8	76.3	75.9	75.8	76.3	72.8	70.0	73.4	69.0
Products of agricultural industries	96.6	95.7	95.0	93.8	92.7	92.4	95.4	107.4	103.0	106.2
Industrial raw materials and products	96.5	96.0	95.3	94.5	93.4	92.6	92.2	94.6	93.3	95.2
Wholesale products in general	91.7	89.2	88.2	87.5	86.5	86.3	85.1	86.6	86.8	86.3
Ireland										
(Department of Industry and Commerce)										
Average 1911 1913 = 100										
Agricultural products in general			134.2	133.2	126.8	116.3	109.6	104.1	111.9	104

(1) Including unmanufactured products

DESCRIPTION	Jan.	Dec	Nov.	Oct.	Sept.	August	Jan.	Jan	YEAR	
	1940	1939	1939	1939	1939	1939	1939	1938	1938	1937
Lithuania										
(Lietuvos Bankas)										
1926-1929 = 100.										
Cereals . . . . .	..	54	50	46	42	42	39	43	41	46
Cattle, fowls . . . . .	...	54	53	53	52	52	52	48	51	49
Leather, hides, wool . . . . .	...	74	71	57	53	53	54	56	51	60
Meat, dairy products and eggs . . . . .	...	57	53	50	46	45	51	49	47	44
Total agricultural products . . . . .	...	56	53	50	46	46	47	47	46	47
Wholesale products in general. . . . .	...	64	60	56	52	52	52	52	51	51
Norway										
(Kgl Selskap for Norges Vel)										
Average 1909-1914 = 100.										
Cereals	173	170	170	170	170	162	167	175	168	173
Potatoes	212	206	202	217	184	127	150	216	174	188
Fork	160	159	154	154	152	131	133	119	127	117
Other meat	167	173	166	168	180	163	162	186	179	187
Dairy products	193	193	192	188	179	179	179	173	176	165
Eggs	107	132	165	157	140	129	114	128	124	124
Concentrated feedingstuffs	174	170	167	159	151	155	155	153	158	152
Maize	175	172	170	168	153	153	162	155	158	149
Fertilizers	113	112	112	90	90	89	93	101	98	95
New Zealand										
(Census and Statistics Office)										
Average 1909-1913 = 100										
Dairy products . . . . .	...	...	129.2	126.2	125.5	125.3	115.9	117.3	121.0	109.2
Meat . . . . .	...	...	166.4	158.1	156.3	157.4	175.0	182.4	175.2	165.1
Wool . . . . .	...	...	107.1	107.1	107.1	114.3	114.3	132.1	117.6	176.8
Other pastoral products . . . . .	...	...	114.0	107.9	98.4	89.0	90.0	113.7	94.7	153.5
All pastoral and dairy products . . . . .	...	...	133.0	129.0	127.6	128.9	130.2	139.1	134.0	142.3
Field products . . . . .	...	...	154.5	154.5	157.8	152.4	136.0	136.4	139.6	136.5
Total agricultural products . . . . .	...	...	133.5	129.6	128.3	129.5	130.3	139.0	134.2	142.2
Netherlands										
(Bureau of Agriculture)										
Average 1924-25 to 1928-29 = 100.										
Plant products	71	70	70	68	66	64	59	60	59	63
Livestock products	73	69	70	70	64	62	61	66	63	66
Total agricultural products	72	69	70	69	65	62	61	64	62	65
Wholesale products in general ⁽¹⁾	86.2	84.7	83.6	80.8	75.4	70.5	70.2	75.2	⁽¹⁾ 73.7	⁽¹⁾ 71.9
Agricultural wages	75	75	75	75	75	75	74	68	74	69

⁽¹⁾ Index numbers calculated by the Central Statistical Bureau of the Netherlands; base 1926-1930. — ⁽²⁾ Agricultural year: April 1-March 31. — ⁽³⁾ Agricultural year: July 1-June 30. — ⁽⁴⁾ Calendar years 1939 and 1938, respectively.

DESCRIPTION	Jan. 1940	Dec 1939	Nov. 1939	Oct 1939	Sept. 1939	August 1939	Jan. 1939	Jan. 1938	YEAR	
									1938	1937
Sweden										
(Sveriges Allmänna Lantbrukssällskap)										
Average 1909-1913 = 100.										
Cereals		134	133	126	113	104	103	123	114	123
Plant products ⁽¹⁾		135	134	127	116	107	104	123	115	123
Meat animals		151	152	158	163	156	141	129	133	126
Dairy products		183	171	166	158	149	162	148	142	134
Livestock and livestock products		174	167	164	158	150	156	144	139	132
Total agricultural products		161	156	152	144	136	139	137	131	129
Feedingstuffs		165	164	162	155	148	144	140	140	139
Fertilizers		107	100	100	93	93	94	97	96	94
Building materials		220	220	217	215	212	180	189	182	191
Machinery and implements		232	228	228	208	204	204	217	218	203
Sundries		151	139	135	127	121	120	129	124	127
Total commodities purchased		168	164	163	154	149	144	148	146	145
Wholesale products in general . . . . .		..	162	159	151	141	134	143	137	145
Agricultural wages . . . . .		...	..	...	...	..	..	204	20	194
Switzerland										
(Schweizerischer Bauernverband)										
1914 = 100.										
Slaughter cattle	124	132	132	129	125	122	109	120	117	122
Slaughter pigs	141	141	143	143	128	118	127	130	125	127
Milk (base price)	123	123	123	117	117	117	121	119	120	118
Total agricultural products	130	132	132	128	124	121	119	124	126	125
Feedingstuffs ⁽¹⁾	129	127	124	121	118	107	108	102	105	97
Fertilizers ⁽²⁾	100	104	105	109	103	98	100	92	96	85
Wholesale products in general ⁽²⁾	127.7	125.1	122.6	120.1	116.8	107.4	105.7	110.0	107.1	111.2
Yugoslavia										
(National Bank of the Kingdom of Yugoslavia)										
1926 = 100.										
Plant products	91.7	90.7	87.0	76.8	73.5	75.7	86.9	87.4	85.8	74.1
Livestock products	85.3	82.8	80.7	71.0	67.7	68.0	64.1	66.7	65.8	65.1
Industrial products	95.5	91.6	86.5	82.9	79.5	78.3	76.6	80.8	78.2	77.6
Wholesale products in general	93.3	90.9	86.8	80.1	76.6	76.8	77.5	80.2	78.3	74.7

⁽¹⁾ Including unspecified products. — ⁽²⁾ Index numbers calculated by the Bundesamt für Industrie, Gewerbe und Arbeit; base July 1914. — ^(*) Provisional data.

APPENDIX

THE SECOND WORLD AGRICULTURAL CENSUS

The International Institute of Agriculture has made preparations for a Second World Agricultural Census to follow that undertaken by many countries in 1930. According to the Programme drawn up by the two conferences of Statisticians, which were held in Rome in October 1936 and December 1937, the Census was to be taken in 1939 in the Northern Hemisphere and in the year July 1, 1939 to June 30, 1940 in the Southern Hemisphere. Where the census cannot be taken in this period, the year chosen is to be as close as possible to the proposed year.

A number of countries took their censuses in 1939 and others will take them in 1940. Below we give a first list, limited to Europe, of the countries where the census was taken in the course of last year and where some information was given on the manner in which it was organized.

Agricultural Censuses taken in European Countries in 1939.

Germany. (Including Austria and Sudetenland). — The census of agricultural and forest holdings was taken on May 17, 1939, as part of the general census of population, professions and enterprises.

A special detailed questionnaire (*Land- und Forstwirtschaftsbogen*) was distributed to all holdings of an area of at least 50 ares. For holdings with a smaller area than 50 ares, information on a smaller number of subjects was requested in the household form (*Haushaltungsliste*) which was distributed as part of the census of population and professions.

The first general results, showing the distribution of land area in large utilization categories and the areas under the principal crops, have recently been published in the XXIVth number of 1939 of *Wirtschaft und Statistik*.

Denmark. — The agricultural census was taken on July 15, 1939.

The information was obtained by means of two questionnaires, one for holdings of agricultural land, woods or plantations, heath, peat bogs and for holdings growing vegetables, fruit and flowers for sale, and another for holdings having only buildings or private gardens with fruit trees, small fruit or livestock. In addition, the special questionnaire requesting information on seed crops was used for agricultural holdings which stated in the principal questionnaire that they cultivated these crops.

Estonia. — The general agricultural census was taken in June and July 1939. A detailed questionnaire was distributed to holdings with at least 1 hectare of agricultural land (fields, gardens, meadows or pasture). Smallholdings with less than 1 hectare of agricultural land and holdings on which live-stock were raised even if there were no land, were covered by means of an abridged questionnaire.

The provisional results were published in the September number of the Monthly Report of the Central Statistical Office of Estonia, and in the *Aratükk k/k Konjunktuur* N° 57/58 (8/9). A summary of these results also appeared in the November, 1939, number of the *Monthly Crop Report and Agricultural Statistics*.

Ireland. — Ireland takes an agricultural census every year, employing census agents who enter the information concerning each agricultural holding in collectors' books. The 1939 census was taken on June 1. In addition to the usual questions, a number of additional questions were put for the purposes of the World Agricultural Census in accordance with the general programme drawn up for this census.

Latvia. — The general agricultural census was carried out between June 26 and July 9, 1939.

A detailed questionnaire was distributed to all holdings with a minimum of one hectare of agricultural land (fields, gardens, meadows or pastures). Smallholdings having an area of 500 square metres to 1 hectare of agricultural land and those which, without possessing land, raised stock, were also covered by the census by means of a less comprehensive questionnaire.

Norway. — The agricultural census was carried out on June 20, 1939.

A detailed questionnaire had to be filled in by all holdings carrying on agriculture, horticulture or stockraising, whatever the area of the land in their holdings, including holdings which raised livestock, even if not combined with agriculture. However, smallholdings with an area of not more than 50 ares of agricultural land (fields, meadows and pastures) were required to fill in only the part of the questionnaire referring to land utilization and to the areas devoted to the principal agricultural and horticultural crops, irrigation, the number of fruit trees, the number of livestock and farm equipment.

Netherlands. — The census of agriculture, within the framework of the statistical organization created following the law during the agricultural crisis of 1923, was carried out between May 15 and 27, 1939.

A questionnaire was distributed to all actual or juridical persons who are affiliated to one of the provincial agricultural crisis organizations, who possess chickens for the sale of eggs or more than one ewe, who are affiliated to the Netherlands Centre for stock breeding, to the Netherlands Centre for vegetables and fruit, to the Netherlands Centre for ornamental plants, or who derive their subsistence partially or totally from agriculture. Persons cultivating five

ares or less of potatoes were exempted from the obligation to fill in the questionnaire provided they were not under obligation to do so for some other reason.

United Kingdom: (a) *England and Wales.* - All persons occupying at least 1 acre of agricultural land, including land utilized for horticultural crops, for nurseries, or for animal pasture, were required to fill in, this year, a detailed questionnaire on the area cultivated to the various crops, the number of livestock and the labour employed on their holdings. The Ministry of Agriculture plans to complete the information thus obtained with further information in regard to agriculture, which will be asked of farmers during the course of a period of five years.

The ordinary census took place in 1939 on June 3. On this occasion, in the questionnaires sent to persons occupying at least 1 acre of agricultural land, supplementary questions were added on the changes that had taken place since June 1928 in the area of land occupied by of each holder and of the number of animals of various kinds that had died or been born on his holding during the twelve months ending May 31, 1939. Another special questionnaire was also distributed, to obtain figures of the number and H.P. of motor machines and of tractors on holdings.

(b) *Scotland.* - The agricultural census was also carried out on June 3, 1939 by a similar system to that adopted in England and Wales.

Switzerland. - The Census of holdings practising agriculture, sylviculture, horticulture, fishing, etc., was taken on August 24, 1939 as part of the Federal Census of undertakings.

A questionnaire was distributed to all holdings with not less than 25 ares of cultivable land, to all holdings with not less than 10 ares, including vines, small fruit, vegetables, tobacco, medicinal plants, etc., to all holdings maintaining productive animals for gain, even without land utilized for agriculture, as well as purely forestal holdings (woods and forests of not less than 25 ares, not included in the census of agricultural or horticultural holdings and also nurseries exclusively for forestry) and to horticultural holdings (horticultural crops, market gardens, flower crops for sale, whatever the area of the land, and nurseries).

A special questionnaire was used for land belonging to cooperatives, consortia, communes, etc.

THE ORGANIZATION OF AGRICULTURAL STATISTICS IN ALBANIA *

The organization of the economic and statistical services in Albania dates from 1930. On April 8 of that year the law was promulgated charging the Ministry of the National Economy with organizing each year all the statistical enquiries in the spheres of economics and industry, covering agriculture and the veterinary services, forestry, mining, industry, commerce and water transport services. An annex to the law gave detailed regulations for the operation of the various services, on the quantity and nature of the information to be collected and on the methods to be adopted for obtaining the necessary returns (1). The service of agricultural statistics is of particular interest in this larger organization owing not only to the fundamental importance of agriculture in the Albanian economy, but also for the methods adopted for obtaining the returns, the wide scope of the inquiries carried out, the form of presentation and the frequency of publication of the data obtained.

Forms employed for the enquiries. — The area and production of crops are obtained by means of two types of forms: one for crops harvested in the summer and the other for those harvested in the autumn. The former is dispatched to the local organizations in the first half of June and sent on to the central authority in September; the second of the two is dispatched in the first half of September and sent in before the end of December.

In both forms the right-hand side of one page gives the text of the ministerial circular asking the local organizations to supply the information and statistics required, while the left-hand side gives instructions for the precise filling in of the questionnaires. The other page contains tables for filling in the statistical returns and consists of two parts, one to be filled in by the villages (or suburbs in the case of municipalities), the other to be completed by the communes (or municipalities) (2).

* The author of this article was a member of a mission of officials of the Central Institute of Statistics of Italy, which visited Albania in order to study the organization of the statistical services of that country and the possibilities of developing and improving them.

(1) Not all the provisions contained in the law and the annex were put into force; some were put into practice only after an interval.

(2) The country is divided into 10 Prefectures, 30 Sub-prefectures, 181 communes and 2,548 villages.

The most important producing centres from the demographic and economic points of view are administered by municipalities in urban districts and by communal centres for villages surrounding the urban areas. The functions of the municipal chiefs are of an urban character and those of the communal chiefs of a rural nature. The municipalities are 22; the suburbs forming a municipality are treated in all cases as villages.

Summer crops, included in the first form, comprised the following arable crops: wheat, oats, barley, rye, spelt, vetches, lentils, broad beans, peas, green haricot beans, melons, onions, tomatoes, flax and meadows, of which luzerne and clover are given separately; in addition, the following tree and bush crops are included: apricots, cherries, peaches, mulberries, apples, pears, almonds, figs, and plums. The second form includes the following autumn crops; arable crops: maize, tobacco, cotton, potatoes, rice, castor oil plants, cabbages, dry haricot beans, tree and bush crops: vines, olives, oranges, lemons, nuts, hazel-nuts, chestnuts, quinces and acorns.

For each crop the figures of area and production are required; for tree and bush crops also the number of trees.

In order to facilitate the final estimation of the statistics of cereals and also in order to know immediately after sowing the area and condition of these crops, a third form is used in which is to be given the information on the area sown, the quantity of seed used and crop condition. This form is dispatched to the local organizations in January and is sent to the central authorities in March.

Returns. — The returns are entrusted simultaneously to the administrative organizations of the villages (or suburbs in the case of municipalities) and to the communes (or municipalities).

The forms are dispatched in the first place to the communes who send them on to the villages. The village headman (*krveplaku*) assisted by the members of the "Council of Elders" (1) and by other persons who can assist in the calculation of the estimates, fills in the figures asked for in the appropriate section of the form. Subsequently, the forms are sent to the commune in which the village is situated; the administrator of the commune, with the collaboration of the Communal Council (2), checks the returns received from the village headmen and inserts the figures arrived at by him. The forms thus completed are sent for sorting and elaboration to the Statistical Bureau of the Ministry of National Economy.

The importance in this system of the Head of the Council of Elders of the village is clear; in fact, in the majority of cases, he is in a position to know fairly approximately the correct quantity of agricultural produce obtained in the village; if certain inaccuracies exist, they are due to the difficulty of estimating the area under cultivation. Frequently the village headman is not in a position to attend personally to the filling up of the forms, the level of education of the people in question being sometimes very modest. In such cases he is required to provide the Communal Secretary with the necessary information.

The Communal Council is not as a rule in possession of sufficient information to enable it to estimate the area of crops and the production in each village except

(1) The number of members of the Council of Elders varies between 2 and 4, according to the size of the village: they are appointed by the people every year.

(2) The Communal Council is composed of a number of members varying from 4 to 8, according to the size of the Communes: these members are elected directly by the people every four years.

in a very rough way. It can in any case supplement or check the calculations of the headman with approximate knowledge of the situation. Generally, it limits itself to correcting the figures if it has reason to believe they are erroneous, allowing, to the extent it deems necessary, for the under- or over-estimating of the village headmen.

The local technical bodies (1) cooperate with the Communal Council, they provide technical information which is very useful and enables a more careful checking of the figures.

In addition to the final return of figures of area and production and the preliminary compilation of statistics relating to cereals, enquiries are frequently undertaken during the year (sometimes, in urgent cases, by telegraph) in order to obtain more detailed or earlier information; these enquiries usually relate to winter cereals, maize, and oil, and are conducted through the Prefectures and Sub-prefectures who pass the work to the administrative and technical bodies under their control.

Checking, elaboration and publication of the statistics. The first checking is done by the Communal Council; the members of the Council not only use any personal knowledge they may have of agriculture but also allow for any errors that may have crept into the estimate (fear of tax increases, external influences, erroneous information, etc.) When the agronomists or the agricultural agents take part in this control, they bring knowledge of the facts and of the technical aspects which assure a greater degree of accuracy in the figures. The Central Administration submits the data to further checking and revision. To begin with, it compares the figures sent in by the village with the communal figures. Usually more reliance is placed on the latter, which seem to be less exposed to the influence of subjective considerations. Where, however, the two series show wide differences, supplementary enquiries are made. To secure greater reliability, other elements of judgement are taken into account, such as the figures of earlier years, forecasts, the quantity of seed used and, in the case of wheat, the quantity threshed. In cases of doubt and uncertainty, the bodies entrusted with the securing of the returns are asked to give explanations but correspondence is often long and difficult, and, if necessary, officials of the central administration or of the local bodies are then sent to the spot to ascertain the facts.

The elaboration of the figures at the central administration is done by machine. By means of subsidiary tables showing the area and production (average and total) of each village or district, the figures are added up and divided by Prefectures.

The statistics are published annually. The volume containing them gives the figures for two years, though the 1938 volume gave only the figures for the year to which it related. The statistics are presented separately for each crop, commune (or municipality), Sub-prefecture and Prefecture. Only the figures

(1) These are agricultural offices, numbering 24, under the Ministry of National Economy. They are set up in all the Prefectures and the 14 Sub-prefectures. Usually, they consist of an agronomist 2 or more agricultural agents, experts and head workers.

of the more important crops listed in the form are published (all cereals, beans, vetches, meadows cotton flax tobacco potatoes, melons and watermelons, vines and olives) The area is expressed in *dynym* (1,000 m²) and production in quintals The tables are preceded by a brief introduction explaining the criteria followed in the returns and by a summary of the results, this summary indicates the total and unit value in gold francs of agricultural production and of the main crops and the statistics of the area and production for the preceding five years

FRANCESCO POLACCO

Prof UGO PAPI, *Segretario generale dell'Istituto, Direttore responsabile*

MONTHLY CROP REPORT AND AGRICULTURAL STATISTICS

The following explanations refer to crop conditions quoted in the crop notes and in the tables. — Crop condition according to the system of the country: Germany, including Ostmark and Sudetenland, Bohemia and Moravia (Protectorate); Hungary and Luxemburg: 1 = excellent, 2 = good, 3 = average, 4 = poor, 5 = very poor; Finland: 8 = very good, 6 = above the average, 5 = average; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = poor; Estonia, Latvia, Lithuania, Poland, Rumania and Sweden: 5 = excellent, 4 = good, 3 = average, 2 = poor, 1 = very poor; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; Portugal: 100 = excellent, 80 = good, 60 = average, 40 = poor, 20 = very poor; Switzerland: 100 = excellent, 90 = very good, 75 = good, 60 = fairly good, 50 = average, 40 = rather poor, 30 = poor, 10 = very poor; U. S. S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = poor; Canada: 100 = crop condition promising a yield equivalent to the average yield of a long series of years; United States: 100 = crop condition which promises a normal yield; Egypt: 100 = crop condition which promises a yield equal to the average yield of the last five years. — For other countries the system of the Institute is employed: 100 = crop condition which promises a yield equal to the average of the last ten years

NOTE: The countries are listed throughout by continents (Europe, followed by the U. S. S. R., America, Asia, Africa and Oceania) in the French alphabetical order. In the tables the Northern Hemisphere precedes the Southern Hemisphere.

VEGETAL PRODUCTION

WORLD WHEAT SUPPLIES AND REQUIREMENTS IN 1939-40.

The survey of the statistical situation of the world wheat market, which is always a delicate and difficult task owing to the complexity of the factors involved, is much more difficult this year owing to the war, which consists not only of an armed conflict but also in large degree of an economic struggle which, directly or indirectly, affects all the states, whether belligerent or not. The normal channels of international trade have been upset, some being blocked and others diverted, while all communications have become more complicated and difficult. The factors affecting the prices, supply and demand of commodities are profoundly altered and the whole organization of international trade is unsettled. Blockades and counter-blockades cut off regions of primary importance. Wheat appears on the list of contraband articles.

Nevertheless, in October last, on the basis of the uncertain and very incomplete information then available, we made a first general review of world wheat supplies and requirements, with the intention of outlining the probable prospects of the present wheat season. Now, six months later, we resume this survey with the aid of data, which are certainly more complete and reliable than before, but offer a much less sure foundation than we are accustomed to work on at this time of the year. While, unlike in October last, it is no longer necessary to conjecture the crops of the Southern Hemisphere, since in most cases official estimates are now available, and for several countries of the North-

ern Hemisphere forecasts or first estimates are now replaced by more reliable estimates, yet, on the other hand, important gaps in the figures, due to the suspension of economic information by various belligerent and neutral countries, have not been filled. Uncertainty regarding the requirements of the principal importing countries remains. This demand can only be estimated hypothetically this year as many conflicting elements are involved. Moreover, statistics of actual imports during the first six months of the season, which normally provide a general indication at this period of the season, are lacking.

Examining the material available it is found that for the exporting countries as a whole the information on stocks, supplies and consumption are sufficient to calculate, without difficulty, the exportable surpluses; on the other hand, corresponding information for the importing countries is much more inadequate. As, however, in the case of the latter the variations in domestic requirements generally vary only within very narrow limits, owing to the number of compensating influences, the general conclusions arrived at in this re-examination of the world statistical situation of wheat may be regarded as reasonably reliable and sure, even though the numerical totals of the various elements this season are not of the same precision as in previous years.

As in last October, we have again refrained in general from publishing information and statistics on the wheat supplies and requirements of each country separately. We merely give general surveys of the various factors involved, by groups of countries.

The World Wheat Acreage in 1939.

Sown on a considerably smaller area than the record figure of the preceding year, the wheat crop in 1939 was large as a result of the generally favourable season.

The expansion in the area under wheat, which had continued throughout the world almost without interruption since the Great War with a continuity that was all the more remarkable in that the wheat market was shaken for several years by one of the worst crises ever encountered, was suddenly checked in 1939, as the result of a new crisis which was particularly acute during the sowing season. The heavy contraction in the area under wheat in 1939 took place exclusively in the exporting countries which were hit by the adverse effects of the overproduction of 1938, whereas in the importing countries the area remained at practically the same level as the previous year.

There was an aggregate decrease in 1939 on the previous year in the exporting countries of 18 million acres, or 8 per cent.; but though considerable, this reduction only reduced the wheat acreage in these countries to the average level of 1933 to 1937, which was still 14 per cent. greater than the area under cultivation before 1928. The four major exporting countries were alone responsible for this increase, for together their wheat sown acreage amounted to 19 million acres less than in 1938; this shows that in the minor exporting countries the tendency to increase the area under wheat continued in 1939,

WHEAT. — *World Sown Area* ¹.

Period	World ⁽¹⁾		All exporting countries			All importing countries		
	Million acres	Index Nos ²	Million acres	Index Nos ²	% of world total ³	Million acres	Index Nos ²	% of world total ³
Averages:								
1909-13	210	87.4	150	82.8	71.3	60	101.7	28.7
1923-27	240	100.0	181	100.0	75.3	59	100.0	24.7
1928-32	267	111.0	204	112.7	76.5	63	105.8	23.5
1933-37	273	113.7	207	114.3	75.8	66	111.2	24.2
Year:								
1938	290	120.7	225	124.3	77.6	65	109.6	22.4
1939	272	113.3	207	114.6	76.2	65	109.2	23.8

(¹) The totals of sown areas were obtained by adding the figures of area sown in the four major exporting countries (Canada, United States, Argentina and Australia) to the figures of areas in other producing countries which generally represent harvested areas. For the latter countries, the two series of figures differ only slightly.

(²) Excluding the U S S R., China, Iraq and Iran — (³) Average 1923-27 = 100

in spite of the heavy fall in prices, in fact a slight increase took place in the group of the Danube countries and in North Africa. Moreover, the reduction in the four major exporting countries was neither general nor uniform. Only three showed a decrease, while the fourth, namely Canada, had a by no means negligible increase, bringing the 1939 acreage to almost the record level of 1932. In addition, Australia sowed only a 5 per cent smaller area in 1939 than in 1938, according to official estimates, and in various commentaries it is stated that the acreage is considerably under estimated, so that instead of a decrease it seems that there was actually an increase in wheat acreage in 1939. In Argentina the drop in the area amounted to nearly 15 per cent. of the 1938 area, but the greatest effort to check overproduction took place in the United States, where, under the combined influence of low prices and the A. A. A. (Agricultural Adjustment Act), the area declined by 16 million acres, or 20 per cent, compared with 1938, bringing the figure practically to the average level before 1928.

The aggregate acreage of the importing countries in 1939 remains practically unchanged from the level of 1938. In Europe the marked tendency to expand the wheat acreage which had continued uninterruptedly from 1930 to 1935, then tended to fall off to some extent due almost entirely to two factors—the slow but steady decline in France, where wheat is giving way to more remunerative crops and the sharp fall in the acreage in Spain since 1936 owing to the Civil War. All the other countries, however, show a considerable increase in acreage since 1930, and this tendency continued in many cases also in 1939. Of the importing countries of Europe which registered record areas in 1939 may be mentioned Estonia, Finland, Greece, Ireland, Italy, Latvia, Norway, Sweden and Switzerland.

WHEAT. — *Area sown in the four Major Exporting Countries.*

Period	United States			Canada			Argentina			Australia		
	Million acres	Index Nos. ¹	% of world total ²	Million acres	Index Nos. ¹	% of world total ²	Million acres	Index Nos. ¹	% of world total ²	Million acres	Index Nos. ¹	% of world total ²
Averages:												
1909-13.	50.7	82.2	24.1	9.9	45.1	4.7	16.1	85.3	7.6	7.6	69.8	3.6
1923-27.	61.7	100.0	25.7	22.0	100.0	9.2	18.8	100.0	7.8	10.9	100.0	4.5
1928-32.	67.4	109.3	25.3	25.6	116.2	9.6	20.3	108.0	7.6	15.7	144.0	5.9
1933-37.	71.2	115.6	26.1	25.1	113.8	9.2	17.9	95.0	6.6	13.1	120.2	4.8
Year:												
1938.	79.6	128.8	27.7	25.9	117.7	9.0	20.9	110.8	7.2	14.2	129.3	4.9
1939.	63.9	103.6	23.5	26.8	121.3	9.8	17.8	94.7	6.5	13.5	125.0	5.0
Maximum area recorded hitherto												
	1937			1932			1928			1930		
	81.1	131.5	28.6	27.2	123.5	10.0	22.8	121.0	8.5	18.2	166.7	6.7

(1) Average 1923-27 = 100 — (2) Excluding the U. S. S. R., China, Iraq and Iran

In the extra-European importing countries the aggregate wheat acreage showed an unbroken tendency to increase until 1938 and also in 1939 in nearly all these countries. The most marked increases took place in Japan, Chosen, Syria and the Union of South Africa, where a further increase on the record of 1938 took place in 1939.

WHEAT. — *Area in Importing Countries.*

Period	European importing countries			Extra-European importing countries		
	Million acres	Index Nos. ¹	% of world total ²	Million acres	Index Nos. ¹	% of world total ²
Averages:						
1909-13.	50	104.7	23.6	10	89.6	5.1
1923-27.	47	100.0	19.8	12	100.0	4.9
1928-32.	50	104.1	18.5	13 ^a	113.7	5.0
1933-37.	52	110.3	19.2	14	115.8	5.0
Year: ¹						
1938.	50	106.2	17.4	15	122.9	5.0
1939.	50	105.2	18.3	15	125.0	5.5

(1) Average 1923-27 = 100 — (2) Excluding the U. S. S. R., China, Iraq and Iran.

Unit Yields of Wheat in 1939.

Following the generally favourable 1938 season, when the world unit yield was the best of the last fifteen years, there was another generally favourable year in 1939, with a world yield that was only slightly below the record of the previous year. On the basis of the present estimates, which are still partly provisional, the yield may be estimated at 15.3 bushels per acre (sown), which compares favourably with the maximum yields since the Great War, namely 14.8 bushels in 1927, 15.0 bushels in 1923 and 15.1 in 1928. The season however, was not favourable everywhere but varied to a marked degree between the different producing regions; in the aggregate of the exporting countries, on a considerably reduced area the season resulted in a yield that was slightly higher than average and a little better than 1938; in the aggregate of the importing countries, on a more or less unchanged area, the yield was considerably smaller than the exceptionally high figure of 1938, which was one of the highest obtained in this group of countries.

WHEAT. — *World Yields per acre* ¹.

Period	World ¹		All exporting countries		All importing countries	
	Bushels per acre ²	Index nos ³	Bushels per acre ²	Index nos ³	Bushels per acre ²	Index nos ³
Averages:						
1909-13	14.9	104.1	13.5	102.2	18.3	99.2
1923-27	14.5	100.0	13.2	100.0	18.4	100.0
1928-32	14.5	100.0	12.9	97.8	19.6	106.5
1933-37	13.3	92.8	11.0	83.1	20.7	112.1
Year:						
1938	15.6	108.2	13.4	101.1	23.0	125.0
1939	15.3	106.2	13.5	102.2	21.6	116.9

(1) Excluding the U S S R, China, Iraq and Iran — (2) Calculated from area sown — (3) Average 1923-27 100.

In the group of the four major exporting countries the unit yield in 1939 was practically as mediocre as that of the previous year; 12.8 bushels per acres against 12.6 in 1938, whilst it was considerably higher than that of the five years ending 1937 (10.0 bushels). The yield is, however, considerably below not only the yields of the period from 1909 to 1913 but also lower than all the yields between 1923 and 1932, with the sole exceptions of 1925 and 1929. Considered separately, the results of the four major exporting countries varied considerably in 1939 one from another. Australia had an exceptionally good yield, much the highest recorded for many years, considerably exceeding, with 15.6 bushels per acre, the record of 1924 (15.2 bushels). Canada also had a satisfactory yield, equal to that of the good average of 1923 to 1927 and considerably higher than any recorded since 1928. In the United States

on the other hand, the yield was rather poor, being but slightly better than the poor yield of the previous year and considerably below the average of the years prior to 1933. Finally, in Argentina the yield was extremely low, being the worst recorded for many years.

In the minor exporting countries results were approximately as satisfactory as those of 1938 in the Danube group of countries and in Turkey, whereas yields were extremely high in the North African countries, and but little different from average in India.

In the importing group of countries yields were on the whole very good but did not reach the record level of the previous year.

In the European importing countries the 1939 yield, though considerably above average, was, at 22.3 bushels per acre, well below the record of 1938 (25.4 bushels). The reason lies in the fact that the season was not uniformly favourable, as in the previous year in nearly all the countries of this continent, but showed very marked differences between different regions. In the Western countries weather conditions were unfavourable and yields declined considerably, whereas in Central and east Europe the season was better and yields remained close to the level of the previous year or even in some countries exceeded it.

The extra-European importing countries had very satisfactory results on the whole, being considerably better even than the excellent crops of 1938. All the major countries of this group (Syria, Palestine, Egypt, Mexico, Japan, Chosen and Manchukuo), report very good yields, the only important exception being the Union of South Africa, where the yield was only about average.

The World Wheat Crop of 1939.

World wheat production in 1939 was very high, without being as large as the exceptionally abundant crop of 1938, it was nevertheless bigger than any preceding that year, even exceeding by about 140 million bushels, or approximately 4 per cent., the record crop of 1928.

The two factors which determine the volume of production, area and unit yield declined in unison in 1939, in contrast to their combined increase in 1938. But as in 1938 both area and yield attained their respective maximums the decrease in 1939 only reabsorbed a part of the previous increases. The area returned to the average level of 1933 to 1937, which was still 13 per cent. larger than the

WHEAT. — *Index Numbers of World Area, Yield and Production.*

(Average 1923-27 = 100)

		Area	Yield per acre	Production
Average	1909-13	87.4	104.1	89.9
"	1923-27	100.0	100.0	100.0
"	1928-32	111.0	100.0	110.9
"	1933-37	113.7	92.8	104.5
Year	1938	120.7	108.2	129.5
"	1939	113.3	106.2	120.2

average of the years prior to the great crisis of 1929. The unit-yield declined very slightly and was still one of the highest of recent years. The influence of these two factors was not equal. Comparing the results of 1939 with the average of 1923 to 1927 it is seen that the increase in world production in 1939 was two-thirds due to the increase in the acreage and one-third due to the improvement in the yield.

The area was particularly responsible for the rise in the exporting group of countries, where it continued to be the principal factor in the size of the crop, whereas the yield remained more or less stationary at the levels of 1938

*WHEAT. — Index Numbers of Area, Yield
and Production in Exporting Countries.*

(Average 1923-27 = 100)

		Area	Yield per acre	Production
Average	1909-13	82.8	102.2	84.9
"	1923-27	100.0	100.0	100.0
"	1928-32	112.7	97.8	110.0
"	1933-37	114.3	83.1	95.1
Year	1938	124.3	101.2	126.0
"	1939	114.6	102.2	116.9

The effects on the size of the crop of the variations in the sown area and unit yields become more evident in comparing the total results of the four major exporting countries.

*WHEAT. — Index Numbers of Area, Yield
and Production in the four Major Exporting Countries.*

(Average 1923-27 = 100)

		Area	Yield per acre	Production
Average	1909-13	74.3	96.8	71.9
"	1923-27	100.0	100.0	100.0
"	1928-32	113.7	95.7	108.5
"	1933-37	112.2	72.0	81.1
Year	1938	124.0	91.4	113.3
"	1939	107.6	93.5	100.6

Last year the heavy increase in acreage largely offset the effects of the low unit yield and the crop was very large, this year the improvement in the unit yield has not compensated for the sharp fall in the acreage under cultivation and production was barely average, or even mediocre. In the last two seasons, therefore, it is the area which has been the principal factor in the size of the crop, while variations in the unit yield have played a less important part.

In the importing countries, on the other hand, it is the unit yield which each year shows the greatest variation and thus determines the size of the crop, since the changes in the acreage move within much narrower limits.

*WHEAT. — Index Numbers of Area, Yield
and Production in Importing Countries.*

(Average 1923-27 = 100)

		Area	Yield per acre	Production
Average	1909-13	101.7	99.2	100.9
"	1923-27	100.0	100.0	100.0
"	1928-32	105.8	106.5	112.9
"	1933-37	111.2	112.1	125.2
Year	1938	109.6	125.0	137.3
"	1939	109.2	110.9	127.5

From this brief review it may be concluded that the large outturn of 1939 was principally due, in the exporting countries, to the area under cultivation, which was still high in spite of the considerable reduction on the previous year, and in the importing countries to the unit yield which was still very satisfactory, in spite of the considerable drop compared with the record of 1938.

While the principal feature of the 1938 crop was its general abundance both in the exporting countries and in the importing countries, this relative uniformity was quite absent in the 1939 crop, which, on the contrary, shows extreme variations between the different producing centres. Among the exporting countries is found the full range of possible results: exceptionally good crops in Australia and Turkey, very satisfactory in Canada and North Africa, good in the Danubian countries, average in the United States and India, and finally extremely poor in Argentina and Uruguay. Among the importing countries the variations are less considerable but here also there are considerable differences between the poor

WHEAT. — World Production.

Period	World ¹		All exporting countries			All importing countries		
	Million bushels	Index Nos. ²	Million bushels	Index Nos. ²	% of world total ¹	Million bushels	Index Nos. ²	% of world total ¹
Averages:								
1909-13	3,130	89.9	2,030	84.9	64.8	1,100	100.9	35.2
1923-27	3,480	100.0	2,390	100.0	68.6	1,090	100.0	31.4
1928-32	3,860	110.9	2,630	110.0	68.1	1,230	112.9	31.9
1922-37	3,640	104.5	2,270	95.1	62.4	1,370	125.2	37.6
Year:								
1928	4,044	116.2	2,883	120.7	71.3	1,161	106.3	28.7
1938	4,508	129.5	3,009	126.0	66.4	1,499	137.3	33.6
1929	4,185	120.2	2,792	116.9	66.7	1,393	127.5	33.3

(¹) Excluding the U. S. S. R., China, Iraq and Iran. — (²) Average 1923-27 = 100.

crops on the one hand of Spain, France, the Netherlands and the barely average production of Great Britain, and the good results on the other hand in the other importing countries of Europe and the exceptionally large crops of the extra-European importing countries (Syria, Japan, Egypt, etc.). It is interesting to compare the results of the three best seasons hitherto recorded, namely 1928, 1938 and 1939. The distribution of the crop was very different in each of the three years. In 1928 it was only the exporting countries which had a record crop, the importing countries having had good but not exceptional results on the aggregate. In 1938 both groups had record outturns. In 1939 neither group had a record compared with the years before 1938 but together amounted to a maximum.

The aggregate production of the four major exporting countries is by no means exceptional, for it is not only much below the records of 1928 and 1938, but is considerably smaller than the average of 1928 to 1932. It has already been stated that each of the four countries had widely varying results. The production of all the other exporting countries together, on the other hand, was very good, approaching close to the record of last year. The Danube countries, French North Africa and Turkey contributed in particular to this result, and to a lesser extent India.

The European importing countries had a production which approaches close to the good average of 1933 to 1937, but which is considerably above the preceding five- and ten-year averages. The extra-European importing countries had a record production, considerably exceeding all previous figures, owing in particular to the very good crops of the Eastern Mediterranean countries and some countries of the Far East.

From the point of view of geographical distribution, it may be noted that, of the various continents, Africa, Asia and Oceania had extremely good results, constituting new records, Europe and North America had more or less better than average outturns, only South America shows an exceptionally poor crop.

WHEAT. — *Production by Continents.*

Period	North & Cent America		South America		Europe		Asia		Africa		Oceania		Total
	Million bushels	Index Nos ¹	Million bushels	Index Nos ¹	Million bushels	Index Nos ¹	Million bushels	Index Nos ¹	Million bushels	Index Nos ¹	Million bushels	Index Nos ¹	
Averages:													
1909-13 . . .	900	74.3	180	65.4	1,360	109.4	490	98.3	102	94.2	98	68.1	3,130
1923-27 . . .	1,210	100.0	278	100.0	1,244	100.0	497	100.0	108	100.0	143	100.0	3,480
1928-32 . . .	1,288	106.4	290	104.8	1,429	114.8	536	107.6	128	118.0	189	132.4	3,860
1933-37 . . .	901	74.4	280	100.4	1,580	126.9	580	116.8	133	122.4	166	116.2	3,640
Year:													
1938	1,293	106.8	400	144.4	1,833	147.3	680	136.7	140	129.3	162	113.1	4,508
1939	1,257	103.8	176	63.6	1,683	135.2	683	137.5	169	156.5	217	151.7	4,185

(¹) Average 1923-27 = 100.

Before completing this analysis of world wheat production in 1939, it may be added that the results given in the various tables do not take into account the statistics of the two great producing countries, the U. S. S. R. and China, in regard to which reliable information is not available but which together represent about one-third of world production. The rather vague and incomplete information available indicates that the 1939 crop of the Soviet Union was about average and that of China not very different from the poor crop of 1938.

Exportable Supplies of Wheat in 1939-40.

The over-abundant crop of 1938, in spite of the sharp drop in prices, could not be absorbed in 1938-39 and left on August 1, 1939 in almost all exporting countries large stocks which have been carried over into the present season.

WHEAT - Total Stocks on August 1 in the principal Exporting Countries.

(million bushels)

YEARS	Four major exporting countries	European exporting countries	Quantities afloat to Europe	Total
Averages				
1923-27	237	44	41	322
1928-32	508	62	38	608
1933-37	480	40	26	546
Years				
1938	268	31	37	336
1939	568	84	35	687

The present season accordingly began with a heavy volume of stocks, which, without quite reaching the maximum levels of 1933 and 1934 (770 million bushels), was not far short of that figure. The distribution of these stocks, however, appeared to be even, which reduced the influence of their size; all the exporting countries, in fact, had on August 1 last much larger carry-overs than usual, only the stocks of Argentina and Rumania being exceptionally high, and much greater than any previous record.

To the stocks left over from the 1938 crop were added the surplus of the good 1939 crop in the exporting countries. It was estimated in October last that this crop, after having provided for internal requirements (for consumption and a minimum carry-over at the end of the season) would have left about 626 million bushels for export. Since October many revisions have been made in the estimates of the various countries. Argentina, which then had in prospect a crop of about 240 million bushels, only harvested half of this quantity. By contrast Australia, which anticipated an average crop, had in fact, an excellent one. The two North American countries increased their estimates, Canada by 40 millions and the United States by 16 millions. In addition, the

estimates of the quantities necessary for the internal requirements of these countries have been reduced particularly in the United States. The revisions in regard to the other exporting countries were of smaller importance and on the aggregate practically negligible. These various changes largely offset each other and on the aggregate the exportable supplies from the new crop show only a small difference compared with the October estimate (637 million bushels compared with the estimate of 626 million six months ago). The largest new crop surpluses were in Canada, Australia, the Danube basin and North Africa; in Argentina on the other hand they are exceptionally low. In the United States the 1939 production after providing for the probable internal consumption of the year leaves a surplus which is less than the minimum carry over. The total surplus obtained in 1939 in all the exporting countries alone exceeds without taking account of the carry over the average import requirements of recent seasons. Although it is considerably smaller than the large surplus from the abundant crop of 1938 it is more than double the average in the five preceding seasons and approaches very close to the very high average of 1928-29 to 1933-34.

Adding to the carry-over on August 1, 1939 the new crop surplus the total quantity available for export during the present season amounts to 1,324 million bushels. This is a very large total which exceeds considerably the already extremely large figure of a year before and is little below the maximum of the seasons 1928-29 to 1932-33. The composition of these stocks is different from that of last season—in 1938-39 about 70 per cent. of the total consisted of new crop wheat and the remainder of old crop stocks; this year the proportion between new and old crops is about even.

WHEAT — World exportable Supplies

Period	Stocks at beginning of year ¹			Exportable surplus of new crop			Total exportable supplies	
	Million bushels	Index Nos. ²	% of total supplies	Million bushels	Index Nos. ²	% of total supplies	Million bushels	Index Nos. ²
Average								
1923-24/1927-28	322	100.0	33.5	638	100.0	66.5	960	100.0
1928-29/1932-33	610	190.0	47.2	680	106.0	52.8	1,290	134.0
1933-34/1937-38	545	170.0	64.9	295	46.0	35.1	840	88.0
Year								
1938-39 (forecast)	336	104.3	29.5	802	125.4	70.5	1,138	118.3
1939-40 (forecast)	687	213.1	51.9	637	99.7	48.1	1,324	137.7

(¹) In the four major exporting countries, in the European exporting countries and afloat — (²) Average 1923-24 to 1927-28 = 100

As regards the distribution of aggregate exportable supplies between the different countries, a little over half the total is concentrated in the United States and Canada which is about normal; the supplies of Canadian wheat

however, are exceptionally high, in the last twenty years Canada had only in 1928-29 larger supplies than those of this season. Argentina, owing to the large stocks of old wheat carried over, has only slightly smaller than average supplies. Australia has a large surplus, which approaches very close to the record of 1930-31 (about 200 million bushels). The countries of the Danube basin, with the large carry-over from the excellent 1938 crop and the heavy new crop surplus have extremely high supplies, which greatly exceed the record of 1938-39.

WHEAT. — *Exportable Supplies by Countries.*

(million bushels)

Period	Canada	United States	Argentina	Australia	Total, major countries	Danube countries ¹	U S S R ²	Other countries ²	Stocks afloat to Europe	Grand Total
Average										
1923-24/1927-28	320	197	190	110	817	54	20	30	40	960
1928-29/1932-33 . . .	390	345	208	163	1,106	81	41	23	39	1,290
1933-34/1937-38 . . .	277	104	171	145	697	61	22	34	26	840
Year:										
1938-39	238	266	261	136	901	145	37	18	37	1,138
1939-40 (forecast) . .	455	257	165	192	1,069	165	15	40	35	1,324

(¹) Including Poland and Lithuania — (²) Exports

At this period of the year official statistics of the international wheat trade during the first six months of the season, from August 1 to January 31, are normally available. This year the increasing lack of information on foreign trade, due to the war, makes it extremely difficult to follow wheat trade movements. Statistics of imports are lacking for almost all the principal wheat importing countries, those of exports are also very incomplete, but, since they are available for the major exporting countries (except in the case of Australia, for which the figures of the first five months only are known), for the Danube countries and for some of the other minor exporting countries, they make it possible, by completing the gaps with conjectural estimates, to construct a rough estimate of total exports during the first half of the current year, which should not be very different from the actual figure. Accordingly, on this basis it has been calculated that the total net exports of the exporting countries were about 320 million bushels during the first six months of the present season, which would represent an increase of about 20 millions compared with the total during the same period of last season. The countries which have most contributed to this increase, have been Argentina, Canada, and the Danube countries, which together more than offset the decreases in the exports of the United States, Australia and the minor exporting countries. On the same basis the exportable balance remaining in the various countries on February 1, 1940 would be about 20 per cent larger than that on February 1, 1939.

WHEAT — *Exportable Supplies on February 1, 1940.* ⁽¹⁾

(million bushels)

COUNTRIES	Year 1939-40			Year 1938-39		
	Total exportable supplies	Net exports from August 1 to January 31	Remainder on February 1	Total exportable supplies	Net exports from August 1 to January 31	Remainder on February 1
Canada	455	95	360	238	93	145
United States . .	257	24	233	266	45	221
Argentina	165	93	72	261	32	229
Australia	192	(2) 29	163	136	40	96
European exporting countries .	165	51	108	145	47	98
North Africa, U S S R and others	55	(3) 22	33	55	45	10
<i>Total</i>	<i>1,289</i>	<i>320</i>	<i>969</i>	<i>1,101</i>	<i>302</i>	<i>799</i>

(1) Supplies afloat excluded — (2) Partly estimated — (3) Rough estimate

On the basis of the distribution of the exportable supplies between the various exporting countries and probable exports during the whole of the season, it may be estimated that on August 1, 1940 the stocks to be carried over to next season will be considerably larger than on August 1, 1939 in Canada, United States and Australia, somewhat smaller in the Danube countries and very small in Argentina

Wheat Requirements of Importing Countries.

In October last, having reviewed the various factors which exercise a counteracting influence on import requirements and which we refrain from repeating here, and having examined the position in each of these countries, we had estimated that the probable import requirements of wheat this season would have reached a total of 600 million bushels, of which 445 millions in the European countries and 155 millions in the extra-European countries. In making these estimates we made it clear that, in spite of their objective nature they could only be treated in the present circumstances as pure conjectures, particularly in the case of each individual country, while on the aggregate they could be considered as much less uncertain. Now, six months later, we re-examine the situation of these various countries on the basis of the new reports received, which, however, are not very numerous and do not involve very considerably modifications, and the total results of these new estimates radically confirm the former figures in regard to the European countries, but involve a slight increase in the estimate of demand of the extra-European countries, which is raised from 155 to 165 million bushels. The revised estimate of world import requirements in 1939-40 would thus be 610 million bushels, in place of the forecast of 600 millions in October.

WHEAT. — *World Import Requirements.*

Period	European importing countries ¹			Extra-European importing countries ²			World import requirements ³	
	Million bushels	Index Nos. ⁴	% of world require- ments	Million bushels	Index Nos. ⁴	% of world ments require-	Million bushels	Index Nos. ⁴
Average:								
1909-10/1913-14.	565	92.0	83.0	115	66.6	17.0	680	86.4
1923-24/1927-28.	610	100.0	78.0	170	100.0	22.0	780	100.0
1928-29/1932-33.	570	93.4	74.6	195	112.8	25.4	765	97.7
1933-34/1937-38.	390	63.6	71.8	150	88.5	28.2	540	69.1
Year:								
1938-39	434	71.0	70.2	184	106.4	29.8	618	78.8
1939-40	445	72.2	72.7	165	95.7	27.3	610	77.4

(1) Total net imports. — (2) Obtained by deducting the demand of the European importing countries from the world import demand. — (3) Total net exports of the exporting countries with an allowance for quantities afloat at the beginning and end of each commercial year.

This estimate may appear not to correspond with the estimate of exports of 320 million bushels during the first half of the season, but in our opinion it may still be correct, assuming that the importing countries have not distributed their requirements uniformly throughout the season but have attempted to acquire supplies as rapidly as possible in these first months. In any case, in view of the domestic supplies available in the importing countries, their demand can vary only within narrow limits, so that any error that may occur in these estimates can only be, on our opinion, of more or less negligible importance.

Situation of Wheat Supplies and Requirements.

Against the large exportable supplies held in exporting countries, probable import requirements appear by comparison very low, so that the surplus which will not be able to be absorbed by the demand of the importing countries and which will have to be carried over to the 1940-41 season remains very heavy. The equilibrium between supply and demand for wheat continues to fall away. During the five years 1923-24 to 1927-28 import requirements absorbed on the average 81 per cent. of exportable supplies; this proportion fell to 59 per cent. in the five years ending 1933-34, rose somewhat to 64 per cent. in the following five years and fell again to 54 per cent. in 1938-39 and 46 per cent. during the present year. In other words, this season exportable supplies represent more than double the average demand of the last six years.

According to the estimates, the quantity, which at the end of the season will go to expand the stocks of the exporting countries for carry-over into the 1940-41 season, will be about 190 million bushels; on August 1, 1940 these stocks will thus rise to over 710 million bushels (including supplies afloat, but excluding the minimum carry-over), and will thus exceed by nearly 20 per cent. the maximum carry-over of 1933. At the average level of world demand in re-

WHEAT. — *Supplies, Requirements and Carry-over.*

		World exportable supplies	World import requirements		Stocks of exporting countries at end of season ¹	
		million bushels	million bushels	% of exportable supplies	million bushels	% of exportable supplies
Average	1923-24 to 1927-28.	960	780	81 0	180	19 0
„	1928-29 to 1932-33.	1,290	765	59 0	525	41 0
„	1933-34 to 1937-38.	840	540	64 0	300	36 0
Year	1938-39	1,138	618	54 0	520	46 0
„	1939-40 (forecast)	1,324	610	46 0	714	54 0

(1) Stocks of four major exporting countries, European exporting countries (excluding minimum carry-over of about 160 million bushels) and quantities afloat

cent years these stocks would be sufficient to supply all the import requirements of 1940-41 and those of about one quarter of 1941-42, without including the exportable surpluses of the 1940 or of 1941 crops.

It may be remarked that in making these estimates we have assumed a very high world consumption^c of wheat, almost equal to the maximum of last year, in spite of the fact that the rise in prices this season reduces the marginal demand for wheat, particularly for feeding.

WHEAT. *Consumption.*

Period	Europe			4 major exporting countries			Other countries			World consumption ¹	
	Million bushels	Index Nos.	% of world total	Million bushels	Index Nos.	% of world total	Million bushels	Index Nos.	% of world total	Million bushels	Index Nos.
Average:											
1909-10/1913-14	1,820	100.0	55.1	780	91.8	23.7	700	90.5	21.2	3,300	95.8
1923-24/1927-28	1,820	100.0	52.8	850	100.0	24.8	770	100.0	22.4	3,440	100.0
1928-29/1932-33	1,940	106.9	51.5	970	113.8	25.8	860	111.0	22.7	3,770	109.5
1933-34/1937-38	1,940	106.7	51.6	930	109.1	24.8	890	115.2	23.6	3,760	109.2
Year:											
1938-39	1,990	109.5	49.8	1,007	118.1	25.2	996	129.0	25.0	3,993	116.0
1939-40 forecast	1,999	110.1	50.4	941	110.3	23.7	1,029	133.3	25.9	3,969	115.4

(1) Excluding the U. S. S. R., China, Iraq and Iran — (2) Average 1923-24 to 1927-28 = 100

Finally, a general review of the world wheat situation may be made by comparing the total wheat supplies with the forecast consumption and the world stocks at the end of the season. Naturally, these statistics taken into consideration are largely approximate calculations, which however, provide an indication of the anticipated changes in the stocks of importing countries.

According to this estimate, world stocks during the 1939-40 season would undergo an increase of about 220 million bushels. As it has been estimated that the stocks of the exporting countries will increase by about 190 million bushels,

WHEAT. — *World Supplies, Consumption and Stocks.*

		Supplies ¹ , ²	Consumption ¹	Stocks ³
		(million bushels)		
Average	1923-24/1927-28	4,060	3,440	620
"	1928-29/1932-33	4,750	3,770	980
"	1933-34/1937-38	4,550	3,760	790
Year	1938-39	5,093	3,993	1,100
"	1939-40 (forecast)	5,288	3,969	1,319

(1) Excluding the U S S R China, Iraq and Iran — (2) Annual production plus Soviet exports, plus stocks at beginning of season, minus exports to China — (3) At end of season

it follows that those of the importing countries will also rise this season. This increase is modest, for it appears that its extent will be about 30 million bushels, but it is, all the same, significant.

The Situation of Crops for the next Harvest.

In regard to the condition of crops, the information available for Europe seems to indicate that in several important wheat producing regions, the damage done to crops by the severe winter has been relatively considerable.

The intense cold and the alternations of frost and thaws caused damage, particularly in several areas of Western Europe. In Hungary the freezing of the ground and the formation of a thick crust of ice threatened crops, the condition of which was considered very unfavourable. In the countries of south-eastern Europe and in Italy, on the other hand, wheat fields, having been in general sufficiently covered by snow during the cold periods, are in good or fairly good condition; the season has prevented excessive growth and ensured a good reserve of moisture in the soil. Field operations, having been prevented or slowed down by the weather conditions, are generally retarded. In several countries a tendency to expand the acreage of spring crops is apparent, in order to offset the reductions in acreage caused by the unfavourable conditions during autumn sowing and by the extremely severe winter. Briefly, although information in several cases is still too vague and incomplete to permit an accurate valuation, European wheat crop prospects appear at present rather unfavourable.

In the U. S. S. R. crop condition is variable. In certain regions the unfavourable conditions in which land preparation and sowing were carried out has affected crops. In others crops have suffered from the severe frost. In the Union as a whole, however, crop condition is considered satisfactory.

In the United States the southwestern wheat belt is still complaining of lack of sub-soil moisture reserves and some damage has been done by alternations of frost; the situation is more favourable elsewhere and is particularly good on the Pacific coast. On the whole, prospects for winter wheat are less pessimistic than in December but a small crop is anticipated. The enquiry on farmers' intentions to plant shows an extension in the acreage of spring

Area sown to Winter Cereals, in thousand acres

(The years indicated are those of the harvest)

COUNTRIES	WHEAT			RYE			BARLEY			OATS		
	1940	% 1940		1940	% 1940		1940	% 1940		1940	% 1940	
		1939 = 100	1934 to 1938 = 100		1930 = 100	1934 to 1938 = 100		1939 = 100	1934 to 1938 = 100		1939 = 100	1934 to 1938 = 100
Greece	2 557	110.2	124.2	151	97.4	87.5	493	95.2	95.4	382	117.0	111.3
Lithuania	346	94.9	90.7	1 248	102.2	100.1	—	—	—	—	—	—
Romania	7 798	81.6	99.9	853	78.5	84.0	226	88.1	115.2	—	—	—
Canada	813	117.5	114.1	766	128.3	119.8	—	—	—	—	—	—
United States	45 014	97.1	88.1	5 640	78.5	86.8	—	—	—	—	—	—
India	32 381	100.4	98.6	—	—	—	—	—	—	—	—	—
Egypt	1 503	100.1	103.5	—	—	—	262	96.0	93.5	—	—	—

(1) Rye for all purposes including an allowance for spring sown rye

wheat In most of the areas destined for this crop both in the United States and in Canada, soil moisture reserves are poor

The season in India was favourable for wheat cultivation during the last period of growth and crop prospects in this country have further improved good yields are now forecast on a slightly increased area than that of 1939

Reports from North Africa indicate favourable weather conditions for the growth of crops and an extension in the acreage sown

G. CAPONE

CURRENT INFORMATION FROM VARIOUS COUNTRIES ON WHEAT, RYE, BARLEY AND OATS.

Estonia The weather in February was very cold the temperature falling to as low as 40° below zero Fahrenheit

France During February and the first half of March the land was being prepared for wheat planting, and sowing began On small and average sized holdings the work is nearly completed and it seems that an area equivalent to that of 1939 has been sown This is not true, however, of the large holdings owing to shortage of labour

The 1939 wheat crop has been officially estimated at 172 million centals (287 million bushels) (*Bulletin des Halles*)

Greece In spite of the very variable and at times very cold weather of last winter, the crop condition of cereals was on the whole good at the middle of February in almost all parts, except for a few districts where crops had been damaged slightly by floods The drought which prevailed during the first three weeks of February, following the very heavy rain and snow of January, rapidly dried fields and alleviated the damage caused by floods The rather low temperature and snow as well as frost retarded the growth of cereals and preserved them from the danger of

Area and Production of Wheat.

COUNTRIES	† AREA				† PRODUCTION							
	1939 and 1939-40	1938 and 1938-39	Aver. 1933 to 1937 and 1938- 1939	% and 1939 and 1939-40	Average 1933 to 1937 and 1938- 1939	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1938- 1939	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1938- 1939	% and 1939 and 1939-40
	ooo acres	ooo acres	ooo acres	ooo acres	ooo acres	ooo centals	ooo centals	ooo bushels of 60 lb	ooo bushels of 60 lb	ooo bushels of 60 lb	ooo bushels of 60 lb	ooo bushels of 60 lb
*Albania	...	95	98	...	...	...	...	...	...	...	...	...
Germany (*)	6,001	5,928	(*) 6,191	101.2	96.9	123,756	139,553	(*) 119,270	206,257	232,584	(*) 198,780	88.7
*Belgium	354	430	399	82.4	88.6	...	12,079	9,556	...	20,131	15,926	...
*Bohemia-Moravia (Protect.)	918	923	3,026	88.1	101.4	...	...	...	...	...	...	...
Bulgaria	3,037	3,448	3,026	88.1	101.4	42,694	47,371	32,188	71,155	78,950	53,646	90.1
Denmark	324	325	294	99.7	110.3	9,039	10,161	7,662	15,065	16,935	12,770	89.0
Spain	8,795	...	() 11,145	...	78.9	67,065	42,417	(*) 90,683	111,773	70,694	(*) 151,136	158.1
Estonia	185	172	160	107.7	115.8	1,880	1,883	1,565	3,133	3,139	2,609	99.8
Finland	334	323	175	103.5	190.3	5,005	5,642	2,748	8,341	9,403	4,579	88.7
France	() 11,683	12,479	13,118	93.6	89.1	...	223,723	179,792	...	372,864	299,648	...
Greece	2,356	2,129	1,989	110.7	118.4	22,975	21,681	15,700	38,291	36,135	26,166	106.0
Hungary	(*) 4,669	4,000	3,910	...	...	(*) 67,660	59,267	48,643	(*) 112,765	98,777	81,070	...
Ireland	255	230	157	110.8	163.1	5,718	4,439	3,276	9,530	7,398	5,460	128.8
Italy	12,841	12,426	12,541	103.3	102.4	176,370	178,394	160,229	293,945	297,317	267,043	98.9
Latvia	378	348	333	108.6	113.7	4,380	4,231	3,944	7,300	7,052	6,574	103.5
Lithuania	500	494	513	101.2	97.4	5,657	5,540	5,396	9,429	9,233	8,993	102.1
Luxemburg	42	57	41	74.0	101.6	594	1,098	656	990	1,810	1,093	94.1
Malta	10	10	9	97.3	100.1	167	177	163	279	296	271	94.2
Norway	...	86	57	...	...	1,531	1,582	1,010	2,551	2,637	1,684	96.7
Netherlands	306	311	355	98.3	86.2	7,981	9,563	9,368	13,301	15,938	15,613	83.5
Poland	...	4,335	4,279	...	...	50,045	47,882	45,521	83,407	79,802	75,867	104.5
*Portugal	...	1,134	1,104	...	...	...	9,481	10,221	...	15,802	17,035	...
Romania	10,079	9,435	9,213	106.8	122.7	98,169	106,295	67,074	165,611	177,154	111,787	92.4
Un Kingdom:	...	...	...	...	...	...	...	...	...	...	...	...
England & Wales	1,683	1,830	1,726	91.9	97.5	34,832	41,552	34,563	58,053	69,253	57,605	83.8
Scotland	81	92	94	87.6	86.0	2,016	2,330	2,379	3,360	3,883	3,965	86.5
*N. Ireland	3	6	7	53.0	41.7	...	128	167	...	213	278	...
*Slovakia	...	...	...	...	...	7,068	...	...	11,780	...	...	...
Sweden	828	759	714	109.0	116.0	18,831	18,111	15,013	31,384	30,184	25,022	104.0
Switzerland	200	195	164	102.7	122.3	3,816	4,687	3,291	6,360	7,812	5,484	81.4
Yugoslavia	5,585	5,328	5,378	104.8	103.8	63,396	66,799	51,801	105,658	111,329	86,334	94.9
Total Eur §	54,115	52,755	50,764	102.6	106.6	746,512	785,293	636,972	1,244,165	1,308,799	1,061,601	95.1
*U.S.S.R.	...	102,550	91,846	...	...	...	897,000	723,604	...	1,494,000	1,205,982	...
Canada (w)	735	742	554	99.0	132.8	13,363	11,888	7,743	22,271	19,814	12,905	112.4
United States (s)	26,021	25,188	24,500	103.3	106.2	280,411	198,118	140,950	467,352	330,196	234,914	137.4
Mexico	1,410	1,240	1,201	113.7	117.4	114,924	146,141	86,564	191,540	243,569	144,273	78.6
Total N. Am	81,862	97,039	77,725	84.4	105.3	755,620	776,190	540,471	1,259,365	1,293,651	900,784	97.3
*China	...	...	48,643	...	...	...	...	464,920	...	2,170	...	...
Cyprus	...	191	180	...	...	1,302	1,210	1,246	...	2,017	...	...
Chosen	860	846	808	101.7	106.4	7,540	6,241	5,566	12,567	10,401	9,277	102.8
India	35,289	35,640	33,982	99.0	103.8	222,365	241,114	213,718	370,608	401,856	356,197	92.2
Iraq	...	1,870	1,855	...	...	13,228	13,228	9,381	...	22,046	15,634	...
Japan	1,823	1,777	1,635	107.6	111.4	36,652	27,147	27,883	61,086	45,244	46,471	135.0
Manchukuo	...	2,805	2,712	...	...	20,688	19,576	19,253	34,480	32,626	32,088	105.7
Palestine	485	515	515	94.2	94.1	1,966	980	1,929	3,227	1,633	3,215	200.7
Syria & Leb	(*) 1,429	1,404	1,313	101.7	108.8	(*) 13,382	14,205	9,745	(*) 22,773	23,674	16,241	94.2
Transjordan	...	...	...	...	...	...	1,876	1,600	...	3,127	2,666	...
Turkey	...	9,497	7,980	...	...	101,587	93,660	67,809	169,309	156,097	113,013	108.5
Total Asia §	52,379	52,675	49,127	99.4	106.6	405,482	404,133	347,149	675,800	673,548	578,579	100.3
Algeria	4,084	4,101	4,151	99.6	98.4	25,574	20,965	20,645	42,622	34,941	34,408	102.0
Egypt	1,501	1,470	1,443	102.1	104.0	29,406	27,561	25,384	49,009	45,935	42,305	106.7
Kenya ()	...	63	51	...	...	...	550	355	...	916	591	...
Libya	...	156	69	...	...	...	776	239	919	1,295	398	71.0
P. Morocco	3,188	2,999	3,213	106.3	99.2	23,259	13,903	14,599	38,764	23,172	24,331	167.3
Tunisia	2,104	1,667	1,876	126.2	112.2	11,133	8,378	7,871	18,555	13,962	13,117	132.9
Total N. Afr.	11,033	10,393	10,752	106.1	102.6	89,923	71,583	68,738	149,869	119,303	114,559	125.6
Argentina	(*) 17,833	(*) 20,868	(*) 17,881	85.5	99.7	70,813	201,724	132,271	118,019	336,199	220,448	35.1
*Chile	2,055	2,044	1,990	100.5	103.3	...	21,322	18,738	...	35,536	31,229	...
Uruguay	1,198	1,256	1,183	95.4	101.3	5,741	9,277	7,952	9,568	15,461	13,252	61.9
Un. S. Afr. (*)	2,131	2,081	1,739	102.4	122.5	9,186	10,256	9,227	15,310	17,093	15,378	89.6
Australia	13,500	14,224	13,091	94.9	103.1	126,240	92,726	95,231	210,400	154,543	158,719	136.1
*N. Zealand	259	193	239	134.0	108.4	...	3,338	4,445	...	5,564	7,408	...
TOTALS	234,051	251,291	222,262	93.1	105.3	2,209,517	2,351,182	1,838,011	3,662,496	3,918,597	3,063,330	94.0

See notes on page 184.

Area and Production of Rye.

COUNTRIES	† AREA					† PRODUCTION							
	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40		1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40	
				1938 and 1938-39	Aver. = 100							1938 and 1938-39	Aver. = 100
ooo acres					ooo centals			ooo bushels of 56 lb					
* Albania		8	7				72	79		129	141		
Germany (1)	11,941	12,150	(2) 12,671	98.3	94.2	208,443	213,849	(2) 195,771	372,221	381,874	(2) 349,592	97.5	106.5
* Belgium	364	381	409	95.5	88.9	...	8,489	8,760	...	15,158	15,613	...	...
* Bohemia													
Moravia													
(Protect)	1,204	1,230	—	97.9	—	—	—	—	—	—	—	—	—
Bulgaria	447	464	491	96.3	91.1	5,417	4,142	4,644	9,674	7,397	8,293	130.8	116.7
Denmark	333	359	358	93.0	93.0	5,512	6,252	5,556	9,842	11,165	9,921	88.2	99.2
* Spain	1,290	—	(3) 1,443	—	89.4	9,639	7,650	(3) 11,134	17,212	13,651	(3) 19,852	126.0	86.6
Estonia	372	365	360	101.9	103.3	5,019	4,146	4,365	8,963	7,403	7,795	121.1	115.0
Finland	568	583	591	97.4	96.2	7,297	8,124	8,187	13,031	14,507	14,619	89.8	89.1
* France . .	(4) 1,601	1,559	1,668	102.6	95.9	...	17,882	17,356	...	31,933	30,994	...	...
Greece	156	178	175	87.7	89.1	1,376	1,366	1,307	2,457	2,439	2,334	100.7	105.2
Hungary . .	(5) 1,728	1,562	1,581	—	—	(5) 19,773	17,739	16,030	(4) 35,310	31,677	28,625	...	...
Ireland	1	2	2	96.3	75.4	29	30	39	52	53	6	97.4	75.2
Italy . . .	260	257	270	101.2	96.3	3,339	3,040	3,301	5,912	5,428	5,895	109.8	101.1
Latvia . . .	737	709	664	104.0	111.1	9,473	8,349	8,105	16,916	14,909	14,471	113.5	116.9
Lithuania	1,229	1,247	1,236	98.5	99.4	14,533	13,751	13,278	25,951	24,555	23,711	105.7	109.4
Luxemburg	19	18	19	108.1	103.1	274	284	271	490	507	483	96.6	101.3
Norway	...	13	15	...	...	228	242	245	408	433	437	94.2	93.3
Netherlands	557	601	501	92.7	111.1	13,228	12,149	10,259	23,621	21,694	18,319	108.9	128.9
Poland	...	14,567	14,227	...	...	168,213	159,911	141,785	300,382	285,556	253,187	105.2	118.6
* Portugal .	...	331	365	...	...	...	2,269	2,299	...	4,051	4,105	...	...
Romania .	1,107	1,190	991	93.0	111.8	9,513	11,402	8,310	16,987	23,367	14,840	83.4	114.5
Un Kingdom													
* Engl and													
Wales . . .	...	16	14	...	...	...	240	194	...	428	347	...	...
* Slovakia	—	—	—	—	—	4,428	—	—	7,907	—	—	—	—
Sweden . .	463	498	551	92.9	83.9	8,340	8,922	9,543	14,894	15,933	17,112	93.5	87.0
Switzerland	39	39	39	101.3	100.7	721	810	717	1,287	1,447	1,280	89.0	100.6
Yugoslavia	650	640	643	101.6	101.0	5,369	5,007	4,627	9,587	8,941	8,262	107.2	116.0
Total Eur. &	35,187	35,640	35,583	98.7	98.9	486,097	481,940	438,805	868,035	860,611	783,579	100.9	110.8
* U S S R .	...	(10) 50,904	59,051	...	...	...	(6) 441,000	(11) 482,679	...	(6) 787,000	(11) 186,930	...	...
—													
Canada .	1,102	741	701	148.6	157.1	8,572	6,153	3,197	15,307	10,988	5,708	139.3	268.2
United States . .	3,811	4,021	3,043	94.8	125.2	21,979	31,116	19,290	39,249	55,564	34,447	70.6	113.9
Total N. Am	4,913	4,762	3,744	103.2	131.2	30,551	37,269	22,487	54,556	66,552	40,155	82.0	135.9
Turkey . .	...	1,130	809	...	...	9,396	9,887	6,659	16,779	17,656	11,890	95.0	141.1
—													
Algeria . . .	5	5	3	116.8	172.7	25	25	18	44	44	31	99.7	140.2
—													
Argentina	(9) 2,296	(9) 2,254	(9) 2,008	101.9	114.3	8,510	6,063	4,471	15,196	10,826	7,984	140.4	190.3
—													
* U. of S. Afr. (8)	...	...	(11) 115	...	...	416	...	450	743	...	80	...	92.4
TOTALS . &	43,531	43,791	42,147	99.4	103.3	534,579	535,184	472,440	954,610	955,689	843,639	99.9	113.2

Area and Production of Meslin.

COUNTRIES	† AREA					† PRODUCTION							
	1939	1938	Average 1933 to 1937	% 1939		1939	1938	Average 1933 to 1937	1939	1938	Average 1933 to 1937	% 1939	
				1938	Aver.							1938	Aver.
= 100	= 100	= 100	= 100										
ooo acres					ooo centals			ooo bushels of 48 lb					
Germany (1)	1,658	1,500 (2)	1,175	110.5	141.2	29,296	29,101 (2)	19,180	50,511	50,175 (2)	33,070	100.7	152.7
Belgium	4	4	8	87.4	48.5	...	90	96	...	156	166	...	...
Bohem & Mo- ravia (Prot.)	9	9	—	101.1	—	—	—	—	—	—	—	—	—
Bulgaria	198	258	249	76.8	79.5	2,596	2,902	2,726	4,476	5,004	4,700	89.5	95.2
Denmark	736	746	810	98.6	90.8	15,432	17,533	16,960	26,608	30,230	29,241	88.0	91.0
Spain	...	...	(11) 111	...	...	...	...	(11) 625	...	...	(11) 1,077	...	...
Estonia	312	209	195	149.3	160.1	3,310	2,460	1,894	5,707	4,242	3,266	134.5	174.7
Finland	24	24	35	103.2	70.8	353	392	535	608	675	923	90.0	65.9
France	(4) 188	188	182	100.2	103.5	...	2,482	2,075	...	4,280	3,578	...	...
Greece	153	156	136	98.3	112.6	1,191	1,122	840	2,053	1,934	1,449	106.2	141.7
Latvia	223	195	181	114.6	123.6	...	2,657	2,188	...	4,581	3,773	...	...
Lithuania	267	277	260	96.3	102.9	3,058	3,279	2,788	5,272	5,654	4,807	93.2	109.7
Luxemburg	3	4	6	65.8	42.6	39	68	92	67	117	159	57.6	42.2
Norway	...	11	12	...	...	209	236	218	361	406	375	88.8	96.2
Poland	...	326 (11)	337	...	...	...	3,924 (11)	3,551	...	6,766 (11)	6,122	...	...
United Kingdom	83	92	97	89.7	85.7	1,613	1,658	1,716	2,781	2,858	2,958	97.3	94.0
England & Wales	628	629	611	99.8	102.8	13,144	14,631	11,729	22,663	25,226	20,223	89.8	112.1
Switzerland	18	18	17	100.0	109.6	346	423	349	597	730	602	81.8	99.2
Yugoslavia	...	169	154	...	...	...	1,334	1,186	...	2,300	2,044	...	...
Canada	1,218	1,159	1,156	105.1	105.4	19,832	17,622	16,221	34,194	30,383	27,968	112.5	122.3
Turkey	...	332	216	...	...	3,256	2,986	1,682	5,614	5,149	2,901	109.0	193.6

NOTES FOR TABLES OF WHEAT, RYE AND MESLIN.

† The years indicated are those of the harvest, single years referring to the Northern Hemisphere, double years to the Southern. — * Countries not included in the totals. — (5) In calculating the totals account has been taken of the probable area cultivated in some countries for which estimates of production are available but not those of area. As the estimates for Hungary for 1939 include the areas and production of territories recently annexed by this country, the totals for Europe and the general totals for 1938 and for the average have been adjusted approximately to maintain the comparability of the series. — (u) Winter crop. — (s) Spring crop. — (1) Including Austria, Sweden and Iceland. — (2) Average 1932 to 1937. — (3) Average of four years. — (4) Estimated on May 1. — (5) Present frontiers excluding Sub-Carpathian Russia. — (6) Approximate calculated figure. — (7) Not including Alexandretta. — (8) Cultivation by Europeans only. — (9) Area sown. — (10) Area provided for in the Plan. — (11) Average of three years.

premature growth and also caused deeper and more sturdy rooting. Crop condition on the whole at the beginning of March was very satisfactory throughout the country.

The area under meslin in 1940 is estimated at 151,000 acres against 195,700 acres in 1939 and an average of 137,400 acres in 1934 to 1938, percentages, 77.2 and 109.9.

Hungary Exceptionally cold weather prevailed in the last three weeks of February. Precipitation was heavy in the first half of this period. Weather conditions were not favourable for winter cereals, particularly owing to the ground being frozen to a great depth and the formation of an ice crust. At the beginning of March a heavy snow cover still covered crops. It appears that winter barley and late sowing of winter wheat and rye have suffered in particular.

Ireland The weather in February was very unsettled, with rain every other day. Cereals came through the winter well, with little or no losses. Ploughing for spring crops was well forward, but sowing had not yet begun at the end of the month.

Area and Production of Barley.

COUNTRIES	† AREA				† PRODUCTION							
	1939 and 1938- 1940	1938 and 1937- 1939	Average 1933 to 1937 and 1938- 1939	% 1939 and 1938-40 = 100	1939 and 1938-39	1938 and 1937-38	Average 1933 to 1937 and 1938-39	1939 and 1938-39	1938 and 1937-38	Average 1933 to 1937 and 1938-39	% 1939 and 1938-40 = 100	1939 and 1938-40
	ooo acres	ooo acres	ooo acres	Aver. = 100	ooo centals	ooo centals	ooo centals	ooo bushels of 48 lb.	ooo bushels of 48 lb.	ooo bushels of 48 lb.	Aver. = 100	ooo bushels of 48 lb.
*Albania . . .	13	13	—	—	92	131	—	192	274	—	—	—
*Germany (¹). . .	4,826	4,838	4,717	99.7	93,956	105,822	86,421	195,746	220,467	180,048	88.8	108.7
*Belgium . . .	48	76	65	62.9	—	1,967	2,046	—	4,098	4,263	—	—
*Bohemia- Moravia (Protect.). . .	644	638	—	101.0	—	—	—	—	—	—	—	—
Bulgaria . . .	563	555	549	101.5	7,359	7,821	6,495	15,332	16,294	13,532	94.1	113.3
Denmark . . .	1,021	982	876	104.0	27,337	29,970	22,132	56,954	62,438	46,109	91.2	123.5
*Spain . . .	3,321	—	4,615	—	30,863	16,270	48,607	64,298	33,897	101,266	189.7	63.5
Estonia . . .	207	217	248	95.6	1,985	2,133	2,009	4,136	4,443	4,186	93.1	98.8
Finland . . .	306	298	376	102.6	4,233	4,572	4,031	8,819	9,524	8,399	92.6	105.0
*France . . .	1,975	1,876	1,806	105.3	—	28,457	23,030	—	59,286	47,979	—	—
Greece . . .	532	541	525	98.3	4,877	5,412	4,373	10,160	11,276	9,111	90.1	111.5
Hungary . . .	1,344	1,121	1,150	—	17,207	15,961	13,920	35,849	33,253	29,002	—	—
Ireland . . .	74	118	132	62.6	1,653	2,468	2,961	3,443	5,142	6,168	67.0	55.8
Italy . . .	497	492	492	101.0	5,409	5,465	4,668	11,270	11,386	9,726	99.0	115.9
Latvia . . .	445	440	459	101.3	4,608	4,863	4,413	9,601	10,131	9,193	94.8	104.4
Lithuania . . .	516	519	516	99.3	5,656	6,041	5,486	11,784	12,586	11,430	93.6	103.1
Luxembourg . . .	5	5	6	106.9	75	67	78	156	140	162	111.6	96.1
Malta (¹). . .	5	5	5	97.6	98	102	99	205	213	207	96.1	99.0
Norway . . .	—	148	148	—	2,793	2,741	2,571	5,819	5,711	5,355	101.9	108.7
Netherlands . . .	102	107	90	95.0	3,086	3,097	2,295	6,30	6,452	4,781	99.7	134.5
Poland . . .	—	2,910	2,963	—	32,629	30,233	31,401	67,977	62,986	65,420	107.9	103.9
*Portugal . . .	—	186	173	—	—	860	872	—	1,791	1,816	—	—
Romania . . .	2,708	3,158	4,123	85.8	17,999	18,347	27,375	37,498	38,223	57,032	98.1	65.7
Un. Kingdom Engl. & W. Scotland . . .	910	885	809	102.8	17,786	17,987	14,573	37,053	37,473	30,361	98.9	122.0
*N. Ireland . . .	99	99	77	100.1	—	2,195	1,649	—	4,573	3,435	—	—
Sweden . . .	3	3	3	101.9	—	74	56	—	153	117	—	—
Switzerland . . .	280	272	256	102.7	5,517	5,876	4,600	11,494	12,241	9,583	93.9	120.0
Yugoslavia . . .	12	11	13	107.1	187	203	169	390	423	351	92.2	111.1
Total Europe (¹) . . .	1,045	1,049	1,073	99.7	9,349	9,287	9,059	19,477	19,349	18,872	100.7	103.2
*U.S.S.R. . . .	20,599	20,714	—	—	263,799	281,995	252,215	549,593	587,500	525,458	93.5	104.6
Canada . . .	4,347	4,454	3,985	97.6	49,511	49,076	35,148	103,147	102,242	73,224	100.9	140.9
United States . . .	12,600	10,513	9,390	119.9	132,623	121,442	88,706	276,298	253,005	184,805	109.2	149.5
*Mexico . . .	—	357	359	—	—	1,536	1,579	—	3,199	3,291	—	—
Total N. Am. . . .	16.9	14.967	13.375	113.2	182,134	170,518	123,854	379,445	355,247	258,029	106.8	147.1
*China . . .	—	—	15,881	—	—	—	166,179	—	—	346,212	—	—
Cyprus . . .	—	115	13	—	1,035	913	938	2,156	1,902	1,954	113.4	110.4
Chosen . . .	2,762	2,738	2,571	100.9	27,314	24,528	25,021	56,905	51,100	52,128	111.4	109.2
*Iraq . . .	—	2,533	1,562	—	—	25,097	8,807	—	52,286	18,349	—	—
Japan . . .	1,879	1,892	1,894	99.3	39,200	30,807	34,727	81,669	64,192	72,349	127.2	112.9
*Manchukuo . . .	—	265	442	—	—	2,150	4,054	—	4,479	8,447	—	—
Palestine . . .	476	502	568	94.8	1,719	1,471	1,339	3,581	3,065	2,790	116.8	128.4
Syria & Leb. Transjordan . . .	888	838	746	106.0	8,157	8,453	6,605	16,994	17,611	13,761	96.5	123.5
Turkey . . .	—	4,851	4,100	—	—	992	760	—	2,067	1,583	—	—
Total Asia . . .	10,971	10,936	9,992	100.3	128,026	119,272	108,634	266,725	284,846	226,326	107.3	117.9
Algeria . . .	3,063	2,909	3,180	105.3	24,251	12,944	16,389	50,524	26,967	34,143	187.4	148.0
Egypt . . .	273	274	284	99.7	5,251	5,129	4,812	10,941	10,686	10,026	102.4	109.1
*Libya . . .	—	367	325	—	—	—	766	—	—	1,596	—	—
*Morocco . . .	4,720	4,155	4,160	113.6	46,915	23,937	25,353	97,740	49,869	52,819	196.0	185.0
Tunisia . . .	1,483	756	1,149	106.0	7,716	2,205	3,946	16,076	4,593	8,222	350.0	195.5
Total Africa . . .	9,539	8,094	8,773	117.9	84,133	44,215	50,500	175,281	92,115	105,210	190.3	166.6
Argentina . . .	(2,122)	(2,053)	(1,921)	103.3	—	—	—	—	—	—	—	—
Chile . . .	—	1,232	1,330	—	17,637	9,700	13,761	36,744	20,209	28,668	181.8	128.2
Uruguay . . .	141	203	193	69.7	—	2,402	2,627	—	5,005	5,473	—	—
— (¹) . . .	62	52	26	119.8	370	306	189	772	638	394	121.0	—
*Un. of S. Afr. . . .	—	—	74	—	—	—	626	—	—	1,303	—	—
*N. Zealand . . .	31	33	29	96.8	—	—	—	—	—	790	—	—
TOTALS . . .	57,207	54,193	53,209	105.5	676,099	626,006	549,153	1,408,563	1,304,195	1,144,085	108.0	123.1

See notes at the end of the following table.

Area and Production of Oats.

COUNTRIES	† AREA					† PRODUCTION							
	1939 and 1939- 1940	1938 and 1938- 1939	Average 1933 to 1937 and 1933- 1934 to 1937- 1938	1939 and 1939-40		1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40	
				1938 and 1938- 1939	Aver. 1933- 1939 = 100							1938 and 1938- 1939 = 100	Aver. 1933- 1939 = 100
ooo acres					ooo centals			ooo bushels of 32 lb.					
*Albania	...	28	24	...	...	...	248	212	...	776	663	...	...
*Germany (1)	8,102	7,917	8,356	102.3	97.0	151,407	158,954	144,624	473,144	496,727	451,946	95.3	104.7
*Belgium	603	527	571	114.5	105.7	...	13,692	15,361	...	42,738	48,002	...	...
*Bosnia	...	...	...	...	...	...	...	...	...	...	...	...	...
Moravia	894	904	...	98.9	...	...	...	...	...	...	...	...	...
(Protect)	274	355	316	77.3	86.8	2,819	1,964	2,555	8,810	6,137	7,984	143.6	110.3
Bulgaria	916	926	932	98.9	98.3	22,487	25,225	21,548	70,272	78,829	67,337	89.1	104.4
*Spain	1,391	...	1,758	...	79.1	10,404	7,033	13,603	32,511	21,977	42,508	147.9	76.5
Estonia	356	368	34	96.8	103.2	3,295	3,891	2,925	10,296	12,160	9,139	84.7	112.7
Finland	1,206	1,143	1,141	105.5	105.7	17,593	18,423	15,171	54,978	57,572	47,409	95.5	116.0
*France	8,010	8,019	8,160	99.9	98.2	...	120,316	101,742	...	375,986	317,942	...	...
Greece	373	383	40	97.4	109....	3,343	3,362	2,477	10,447	10,505	7,741	99.5	135.0
Hungary	636	554	545	...	...	7,864	6,842	6,152	24,575	21,382	19,225	...	...
Ireland	537	570	593	94.1	90.5	12,088	12,523	12,952	37,775	39,133	40,474	96.5	93.3
Italy	1,044	1,193	1,073	95.5	97.3	12,938	13,869	11,820	40,430	43,342	36,938	93.3	109.5
Latvia	935	860	98	108.8	117.2	9,927	9,846	7,913	31,023	30,769	24,727	100.8	125.5
Lithuania	859	838	154	102.5	100.6	9,016	9,259	8,108	28,176	28,936	25,338	97.4	111.2
Luxembourg	62	61	66	100.8	93.9	992	916	963	3,100	2,864	3,100	108.3	103.0
Norway	...	211	221	...	...	4,038	4,337	3,960	12,620	13,554	12,375	93.1	102.0
Netherlands	403	69	3.4	109.0	120.5	9,921	9,845	6,906	31,002	30,765	21,580	100.8	143.7
Poland	5,734	5,627	5,535	01.9	103.6	63,493	58,565	56,503	198,415	183,015	176,570	08.4	112.4
*Portugal	...	618	527	...	...	...	2,090	1,54	...	6,530	6,106	...	...
Romania	1,455	1,609	1,998	90.4	72.9	10,736	10,209	14,653	33,548	31,904	45,792	105.2	73.3
United Kingdom:	...	...	...	...	...	...	...	...	...	...	...	...	...
England	1,358	1,301	1,397	104.4	97.6	25,066	23,946	24,631	78,330	74,830	76,972	104.7	101.8
Wales	774	798	821	7.0	93.3	...	1,179	14,909	...	44,310	46,592	...	...
*Scotland	291	297	77	98.2	106.9	...	6,489	5,819	...	20,279	18,185	...	...
*N. Ireland	1,647	1,647	1,639	100.0	100.5	28,328	30,441	26,610	88,526	95,127	83,154	93.1	106.5
Sweden	30	8	29	105.6	101.2	564	560	464	1,764	1,750	1,451	100.8	121.5
Switzerland	...	914	917	...	...	7,679	7,199	7,103	23,996	22,496	22,195	106.7	108.1
Yugoslavia	27,052	26,876	27,531	100.6	98.3	403,594	411,278	379,140	1,261,227	1,285,242	1,184,803	98.1	106.4
Total Europe	...	...	...	...	...	...	...	...	...	...	...	...	...
*U.S.S.R.	...	41,196	43,544	...	...	...	349,163	386,399	...	1,091,128	1,207,488	...	...
Canada	12,790	13,010	13,538	98.3	94.5	130,698	126,270	106,295	408,432	394,593	332,173	103.5	123.0
United States	33,070	35,661	34,880	92.7	94.8	299,909	341,898	282,719	937,215	1,068,431	883,498	87.7	106.1
Total N. Am.	45,860	48,671	48,127	94.2	94.7	430,607	468,168	389,014	1,345,647	1,463,024	1,215,671	92.0	110.7
*China	...	...	2,527	...	...	...	...	19,108	...	...	59,712	...	...
*Cyprus	...	14	12	...	...	...	89	71	...	277	222	...	...
*Japan	...	337	30	...	...	...	4,523	3,687	...	14,135	11,505	...	...
*Manchukuo	...	242	86	...	...	...	1,193	775	...	3,727	2,421	...	...
Palestine	2	2	2	108.6	92.3	20	9	15	63	28	48	229.2	130.7
Syria & Leb	12	24	29	47.7	39.4	120	218	267	375	682	86	55.0	44.9
Turkey	...	596	531	...	...	6,512	5,680	4,574	20,351	17,748	14,294	114.7	142.4
Algeria	516	451	457	114.5	113.0	4,850	3,486	3,234	15,157	10,892	10,107	139.2	150.0
Fr Morocco	131	120	87	109.3	163.5	1,676	1,048	569	5,236	3,275	1,777	159.9	294.6
Tunisia	99	99	71	99.8	140.2	661	661	381	2,067	2,067	1,192	100.0	173.4
Total N. Afr.	7.6	670	60	119.1	122.8	7,187	5,195	4,184	22,460	16,234	13,076	138.4	171.8
Argentina	...	(3,446)	(3,361)	102.5	104.7	...	...	...	...	...	...	...	...
Chile	...	1,766	1,76	...	...	20,371	16,094	16,470	63,658	50,293	51,468	126.6	123.7
Uruguay	257	337	49	76.2	103.2	...	3,366	2,213	...	10,519	6,915	...	...
Uruguay	219	246	20	89.6	108.6	983	1,149	934	3,073	3,589	2,917	85.6	105.3
*Un of S Afr	...	...	50	...	...	...	...	2,165	...	...	6,765	...	...
*N. Zealand	...	254	280	...	90.8	...	...	...	...	...	...	...	...
(1)	...	54	68	...	...	...	1,042	1,168	...	3,256	3,650	...	...
TOTALS	76,253	78,851	79,094	96.7	96.4	869,394	907,791	794,598	2,716,854	2,836,840	2,483,113	95.8	109.4

† The years indicated are those of the harvest, single years referring to the Northern Hemisphere, double years to the Southern. — * Not included in the totals. — § In calculating totals account has been taken of the probable area cultivated in some countries for which estimates of production are available but not those of area. As the estimates for Hungary for 1939 include the areas and production of territories recently annexed by this country, the totals for Europe and the general totals for 1938 and for the average have been adjusted approximately to maintain the comparability of the series. — (1) Including Austria, Sudetenland and Memel. — (2) Average 1932-37. — (3) Average 1933-36. — (4) Area sown. — (5) Including the northern territory annexed by Hungary but excluding the Sub-Carpathian territory. — (6) Frontiers as at the end of 1937. — (7) Barley and meslin. — (8) Area provided for by the Plan. — (9) Approximate estimate. — (10) Average 1933-35. — (11) Year 1936. — (12) Area harvested. — (13) Malting barley. — (14) European crops only.

Lithuania: The weather was settled in February. Except on a few days, temperatures were rather low throughout. The fields had a deep snow cover. These conditions were favourable for winter crops.

Romania: During the week ending March 13 heavy snow fell in almost all parts of the country and particularly in the northern half of Basarabia and in Bucovina. The soil was very wet and field operations have consequently been retarded this season. Owing to the unfavourable conditions in the autumn for the ploughing and sowing of winter cereals and the prolonged winter, the Ministry of Agriculture and administrative organizations have conducted a very intense campaign among farmers to complete ploughing and sowing. The authorities assist farmers in a practical way by putting at their disposal the necessary seeds, all the tractors of the Chambers of Agriculture and credits. Although the sowing season is shorter this year, it is nevertheless hoped to sow a normal acreage.

Yugoslavia: The weather in the first decade of February was cloudy and often misty in the mornings and rather mild in all parts. In the north and centre rain alternated with snow, while in the southeast and on the coast the weather was rather fine and warm. At the beginning of the second decade a sudden cold spell passed over the north and centre of the country bringing a sharp drop in temperature, while in the south and on the littoral there were warm winds. At the middle of February the cold had reached its maximum (-24°F at Zagreb), spreading throughout the country, except in the far south and on the littoral, where the temperature remained on the whole above freezing point throughout the winter. This cold spell continued until the last few days of February. At the end of February and the beginning of March the weather became milder in almost parts of the country. Winter cereals had not suffered from the cold, thanks to the heavy falls of snow which took place in all parts about the middle of February and continued throughout the remainder of the month.

U. S. S. R. The recently published figures of the average yields of the principal cereals in Ukraina in 1939 are reproduced below with the averages of the two three-year periods 1937 to 1939 and 1932 to 1934.

Yields of Cereals in Ukraina in 1939

Crops	Year 1939	Average 1937 to 1939	Average 1932 to 1934	Year 1939	Average 1937 to 1939	Average 1932 to 1934
	Yield in centals per acre			Yield in bushels per acre		
Winter rye	10.3	10.7	7.4	18.3	19.1	13.2
Winter wheat	14.2	12.8	8.3	23.6	21.3	13.8
Spring wheat	9.2	6.8	6.5	15.3	11.3	10.9
Spring barley	13.6	11.2	8.3	28.3	23.4	17.3
Oats	11.0	10.0	7.8	34.3	31.2	24.3

The crop condition of the winter cereals, according to a report issued on February 22 at a meeting of the Commissariat for Agriculture, is better this year than it was last year. The crops are not well developed in central and southeastern parts of the Union. The winter was favourable for the seedlings up to January 5 but after

that date severe frosts caused damage in some areas. The necessity of examining the sowings carefully to determine the extent of the damage and the measures to be taken was recognized.

At the end of February the condition of the sowings according, to the Soviet Press, was generally good or satisfactory, despite unfavourable weather at the end of the summer and in the autumn. However, in some areas, where preparation was inadequate or where sowing was late, condition was poor.

In February, in the southern regions (Caucasus, Crimea, South Ukraina, Central Asian Republics) there were many warm days which rendered it possible to begin soil preparations and sowings of spring cereals. There was a considerable drop in temperature in many districts at the beginning of March accompanied by snowfalls but it was believed that no damage was done.

United States The Crop Reporting Board has made the following estimates of the intended acreages of the cereal crops in 1940. The figures are based on reports made by farmers on or about March 1 regarding their planting intentions. The acreages actually planted in 1940 may turn out to be larger or smaller than the indicated acreages owing to weather conditions, price changes, labour supply, financial conditions, the agricultural conservation programme and the effect of these estimates themselves upon farmers' actions.

	Intentions 1940	Area planted 1939	Average planted area 1934-38	% 1940 1939 100	Average = 100
	(thousand acres)				
All spring wheat	19,425	17,532	22,304	110.8	87.1
Barley	14,606	14,546	11,912	100.4	122.6
Oats	35,818	35,512	38,421	100.9	93.2

India Weather at the time of sowing was not quite favourable but prospects at the end of February were considered to be on the whole fairly good.

General rain fell in the Punjab in the week ending February 5, the succeeding week was dry except for light rain in Ambala and Dera Ghazi Khan, and the week ending February 26 was dry throughout the province. At that date crops were in average to good conditions in irrigated areas and under average to average in irrigated areas.

In the Central Provinces, the third most important producing area, light rain fell in the fortnight ending 24 February. Crop condition was satisfactory.

Japan The crop condition of wheat and barley is normal.

Palestine Rains in December and January were very well distributed. Sowing was carried out in favourable conditions and in normal weather. Crop condition is excellent. No disease is reported.

Algiers Wheat sowing was nearly completed on March 15. The area was considerably larger than last year. Prospects are favourable (*Bulletin des Halles*).

Egypt The growth of wheat was stimulated after the irrigation of crops and the manuring of those which had not already received any fertilizers. The irrigation situation was satisfactory and spring rotations were begun on February 16. The

water was let into the canals before the prearranged date. In spite of the lack of rain during the winter closing of the canals and the consequent heavy demand for water, the water supply was sufficient to irrigate all crops. Ear formation progressed in February among early crops and some mid-season crops and the grain began to form in a few fields principally in the provinces of Qena and Aswan. Crop condition was normal. The growth of barley was good. Ear formation was general at the end of February and among early crops grain formation was beginning. Irrigation was in progress. Crop condition was normal.

CURRENT INFORMATION ON MAIZE.

U. S. S. R.: The wet autumn and severe frost of mid-January had a very unfavourable effect on the possibilities of germination of maize to be sown both in the Ukraina and in Kuban, which are the principal maize growing centres of the Union. Measures are being taken to ensure a good supply of seed by means of selection and treatment.

Argentina. The second estimate of the area sown to maize in 1939-40, published on March 6 by the Argentine Government confirms the previous estimate of 17,800,000 acres, which represented a record, except for the area sown in 1935-36. Thus, it exceeds by 35.8 per cent the final figure of last season and by 6.4 per cent the preceding five-year average. The latest reports on crop condition confirm the forecast of a very large maize crop, of which the official estimate will be published on April 12.

United States. The Crop Reporting Board estimates that the prospective maize plantings in 1940 will cover an area of 87,770,000 acres. This estimate is based on reports received from farmers on or about March 1 regarding their planting intentions (see under Cereals). The area planted in 1939 was 91,501,000 acres and the average planted area in the five years 1934 to 1938 was 97,761,000 acres. Percentages, 95.9 and 89.8.

Egypt. According to the last estimate, the area cultivated to millet in 1939 was 428,000 acres against 404,000 in 1938 and 321,000 on the average of the five years ending 1937, percentages 105.8 and 133.3. The corresponding production is estimated at about 11,784,000 centals (23,568,000 bushels) against 10,364,000 (20,728,000) and 8,647,000 (17,293,000), percentages 113.7 and 136.3.

Union of South Africa. Practically all the maize-growing districts of the Union suffered drought in January, including even these parts of Transvaal which had had excessive rainfall in the previous month. Crops which had reached the flowering stage suffered damage, particularly in the Orange Free State, where prospects at the end of January were poor, unless rains should come immediately. Younger maize crops were not affected so much by the drought. Local damage was done by hail and insects in Transvaal. Locust swarms were prevalent in Transvaal and Natal.

Area and Production of Maize.

COUNTRIES	† AREA					† PRODUCTION							
	1939	1938	Aver 1933 to 1937	% 1939 and 1939-40		1939	1938	Average 1933 to 1937	1939	1938	Average 1933 to 1937	% 1939 and 1939-40	
	and	and	and			and	and	and	and	and	and		
	1919-1940	1918-1939	1914 to 1917 and 1917-1938	1938-1939	Average 1939-40	1910-1940	1915-1939	1933-34 to 1937-38	1939-1940	1938-1939	1933-34 to 1937-38	1938-1939	Average 1939-40
	ooo acres					ooo centals			ooo bushels of 56 lb.				
Albania		230	216				3,116	2,795		5,564	4,991		
Germany (1)	271	347 (1)	202	78.0	—	...	8,369 (1)	4,642	...	14,944 (1)	8,290	...	...
* Bohemia													
Moravia													
(Protect.)	23	22	—	103.9	—	...			...			...	—
Bulgaria	1,527	1,731	1,720	88.2	88.8	...	11,735	10,756	...	20,955	35,278	...	...
* Spain	1,058		1,075	98.4	...	...		16,048	...	28,656	...	...	...
France	814	841	444	96.8	96.4	...	12,756	11,301	...	22,779	20,181	...	...
Greece	(1) 684 (1)	(1) 71 (1)	625	102.0	109.4	...	5,766	4,399	10,296	7,853	10,112	131.1	101.8
Hungary	(1) 3,150 (1)	2,971 (1)	2,840	—	—	(1) 49,624 (1)	58,688 (1)	47,080 (1)	88,615 (1)	104,801 (1)	84,072	—	—
Italy	(1) 3,185 (1)	3,297 (1)	3,220	96.6	98.9	...	58,077	58,948	...	103,710	105,265	...	...
Malta	(1) 456 (1)	427 (1)	401	106.7	113.9	...	6,658	6,107	...	11,889	10,905	...	...
Poland	0	0	0	85.7	97.1	2	3	4	4	5	7	84.0	55.7
Portugal	...	218	225	...	...	...	2,783	2,055	...	4,969	3,670	...	...
Romania	...	971	1,036	...	...	...	6,531	6,794	...	11,662	12,132	...	...
Switzerland	12,187	12,349	12,563	98.7	97.0	133,407	112,819	110,865	238,227	201,462	197,973	118.2	120.3
Yugoslavia	(1) 6,575 (1)	(1) 7,022 (1)	6,708	93.6	98.0	...	54	51	...	9 (1)	2	77.7	82.9
Total Europe	...	31,155	0.750	...	...	...	39,487	376,491	...	702,645	672,308	...	...
U. S. S. R.	...	106,618	7,968	...	...	...	60,811 (1)	84,056	...	108,592 (1)	150,100	...	...
Canada	183	180	159	101.7	115.2	4,534	4,306	3,495	8,097	7,690	6,222	105.3	130.1
U. S. A. (12)	88,803	92,222	96,176	95.3	97.3	1,466,717	1,434,870	1,156,162	2,619,137	2,562,107	2,064,575	102.2	126.9
Mexico	(78,861)	(82,710)	(77,139)	95.3	102.2	(132,634)	(128,938)	(99,335)	(2,600,600)	(2,303,265)	(1,773,813)	102.5	133.1
Total N. Am.	...	7,638	7,406	...	...	...	37,317	37,634	...	66,635	67,205	...	...
* China	...	11,150	...	...	...	...	141,429	...	...	252,552	...	...	...
Korea	...	342	302	...	...	...	2,174	2,134	...	3,887	3,811	...	...
Japan	...	135	123	...	...	...	1,850	1,612	...	3,303	2,878	...	...
Manchukuo	...	4,351	2,978	...	...	54,675	55,336	41,241	97,634	98,814	73,645	98.8	132.6
Palestine	19	21 (1)	16	93.1	122.8	137	177 (1)	161	244	315 (1)	287	77.4	85.1
Syria & Leb.	49	48	52	101.3	95.1	...	606	538	...	1,031	961	...	...
* Transjord.	...	...	...	...	...	...	3	3	...	6	6	...	...
Turkey	...	1,171	1,071	...	...	...	13,305	11,997	...	23,759	21,423	...	...
Total Asia	...	6,068	4,542	...	...	...	73,448	57,683	...	131,144	103,005	...	...
Algeria	16	15	18	104.4	85.9	...	94	104	...	168	189	...	...
Egypt (13)	1,606	1,545	1,614	103.4	99.1	33,584	34,449	35,071	59,972	61,516	62,627	97.0	95.4
Kenya (13)	...	112	112	...	...	...	178	129	...	318	230	...	...
French Morocco	...	1,141	1,015	...	...	...	1,817	1,824	...	3,244	3,257	...	...
Anglo-Egypt	...	...	...	...	...	...	4,792	4,360	...	8,558	7,785	...	...
Sudan	...	26	26	...	...	...	70	236	...	124	422	...	...
Tunisia (14)	62	43	52	145.2	118.3	...	121	126	...	217	224	...	...
Total N. Afr.	...	2,891	2,844	...	...	...	41,521	41,85	...	74,145	74,734	...	...
Argentina	(177,922)	(130,977)	(167,222)	135.8	106.4	...	...	...	...	...	...	...	...
Chile	...	8,654 (1)	11,228	...	...	...	107,233	183,495	...	191,488	327,671	...	...
Uruguay	559	541	553	103.3	101.1	...	1,399	1,380	...	2,408	2,464	...	...
Java & Mad.	...	5,016	5,060	...	...	...	3,498	2,938	...	6,247	5,246	...	...
Madagascar	...	247	224	...	...	...	43,003	43,422	...	76,792	77,539	...	...
Un. of S. Afr. (15)	...	6,682	5,764	...	...	...	2,205	2,063	...	3,937	3,684	...	...
New Zealand	...	6	7	...	...	...	52,396	33,488	...	93,564	59,800	...	...
TOTALS	...	169,753	174,524	...	...	...	2,261,726	2,032,870	...	4,038,795	3,630,127	...	...

† The years indicated are those of the harvest, single years referring to the Northern Hemisphere, double years to the Southern. — * Not included in the total. — † In calculating the totals account has been taken of the probable area cultivated in some countries for which estimates of production are available but not those of area. — (1) Including Austria and Sudetenland. — (2) Excluding Sudetenland. — (3) For the former territory of Germany the production is estimated for the years 1933 to 1936. — (4) Average 1933-35. — (5) Area sown. — (6) Including the northern territory annexed by Hungary but excluding the Sub-Carpathian territory. — (7) Frontiers as at the end of 1937. — (8) Maize sown in spring. — (9) Maize sown in summer. — (10) Area provided for by the Plan. — (11) Approximate estimate. — (12) Maize for all purposes. — (13) Maize harvested as grain. — (14) Average 1935-37. — (15) *Nili* maize. — (16) *Nili* maize. — (17) European crops only. — (18) Maize and sorghum. — (19) Area harvested. — (20) Cultivation by natives.

RICE PRODUCTION AND TRADE IN MONSOON ASIA.

The data at present available for the season 1939-40 cover three-quarters of world rice production if China is excluded from the calculation and about one-half if China is included. Assuming that production in the countries for which data are not yet available will show little change from last season, world production, excluding China, is probably about 1 per cent larger than in 1938-39.

The following table gives the latest estimates of production for the last seven seasons.

World production of rough rice ⁽¹⁾.

(millions of pounds)

1939-40	. . . . .	203,000
1938-39	. . . . .	201,000
1937-38	. . . . .	207,200
1936-37	. . . . .	206,800
1935-36	. . . . .	187,900
1934-35	. . . . .	189,400
1933-34	. . . . .	200,700

⁽¹⁾ Not including China and Iran

Production in the major exporting countries. — Of the three major exporting countries only Burma has published a final estimate of the 1939-40 crop. For Thailand only the first estimate of production is available, while for French Indochina the most important statistical elements are lacking at this date.

In Burma the area harvested is now estimated at 12,018,600 acres, a further decrease from the 1937-38 maximum of 12,591,100 acres and a decrease of 2.6 per cent. on the five-year average of 12,342,900 acres. The area sown was 12,853,900 acres, a very slight recovery on last season's figure and 0.9 per cent. above the average of 12,738,000 acres for the five years ending 1937-38. The area damaged was unusually high, being 835,300 acres, about 6.5 per cent. of the sown area, or double the average proportion of damage in the preceding seven seasons. The absolute area damaged is the largest in many years. This is due principally to the disastrous floods and, in the latter half of October to the shortage of rain. Even the rain in Lower Burma in the second half of November was probably disadvantageous to the earlier varieties. Production, estimated at 11,641 million pounds of white rice and derivatives, has actually shown a diminution of 13.0 per cent. on the large 1938-39 crop of 13,381 million pounds. Nevertheless, as the reduction on the five-year average of 11,980 million pounds is only 2.8 per cent., this season's crop may be considered a normal one.

For Thailand there is no new information. According to the first forecast the crop is a record one, being 12 per cent. above that of last season and 14 per cent. above the average of the five years ending 1937-38. There was also a record area under rice.

Area under Rice in India, Burma, Thailand and French Indochina

(in thousands of acres)

YEAR	India	Burma	Thailand	French Indochina ⁽¹⁾
1939-40	72,340	12,854	8,856	...
1938-39	73,375	12,841	8,666	⁽²⁾ 14,800
1937-38	72,554	12,945	8,328	13,788
1936-37	72,295	12,634	8,051	13,945
1935-36	70,998	12,503	8,347	13,493
1934-35	69,731	12,688	8,245	13,184
1933-34	70,340	12,919	8,019	13,305
1932-33	69,960	12,702	7,942	13,526
1931-32	71,745	12,518	7,638	13,103

(1) Final estimates of area harvested, comparable statistics of sown area not being available. — (2) Rough estimate

For French Indochina the statistical data at present available are relatively unimportant. In Cochinchina, the principal source of exports from Saigon, yields of early rice were reported to be satisfactory. Both there and in Cambodia flood damage has been reported but its proportions are not known.

This season has combined unusually high damage in Burma with only moderate damage in Thailand, thus reversing the usual conditions. The increase in the Thailand crop does not compensate for the decrease in that of Burma, while the unofficial estimate of export surplus indicates expectations of a decrease in production in the third of the great exporting countries.

Production and Exports of the major Exporting Countries

(in millions of pounds of white rice and derivatives)

YEAR	Burma		Thailand		French Indochina		Total	
	Product	Export	Product	Export ⁽¹⁾	Product	Export	Product	Export
1939-40	11,641 ⁽²⁾	7,168	8,404 ⁽²⁾	3,472	11,000 ⁽²⁾	3,638	31,861 ⁽²⁾	14,278
1938-39	13,381 ⁽²⁾	8,128	7,480	3,945	11,000 ⁽²⁾	3,527 ⁽²⁾	31,861 ⁽²⁾	15,600
1937-38	11,423	6,864	7,533	3,196	10,153	2,316	29,109	12,376
1936-37	11,787	7,155	5,589	2,070	10,165	3,322	27,541	12,547
1935-36	12,478	7,007	7,783	3,655	9,731	3,751	29,922	14,413
1934-35	11,314	7,174	7,602	3,576	8,865	3,663	27,781	14,413
1933-34	12,897	8,465	8,280	4,127	9,388	3,250	30,565	15,842
1932-33	12,265	7,383	8,460	3,566	9,324	2,784	30,049	13,733
1931-32	10,453	6,799	6,727	3,357	9,036	2,624	26,216	12,780

(1) Exports tel quel, from Bangkok, December to November. — (2) Official estimates of export surplus — (3) Tel quel, to 27 December — (4) Unofficial estimate of export surplus — (5) Rough estimate — (6) Tel quel

The surplus available for export from Burma is estimated at 7,168 million pounds of white rice and derivatives, about 12 per cent. below the actual export of 8,128 million in 1939 and 2.3 below the average export of 7,333 million in the five years 1934-38. Unofficial estimates of the surpluses available for export from Thailand and French Indochina respectively are 3,472 million and 3,638 million pounds, both figures lower than the actual exports from these

countries in 1939. The total surplus available for export from the three major exporting countries would thus appear to be considerably smaller than their actual exports in the last calendar year. The combined exports in 1939 were, however, rather high so that this year's available surplus may still be regarded as normal.

Situation in the principal importing countries and in territories under Japanese control. — In India, the largest importer of rice, the area sown is esti-

*Production in the principal Asiatic rice-importing Countries,
excluding Japan*

(in millions of pounds of white rice and derivatives)

YEAR	India	China	British Malaya	Java • and Madura	Philippines
1939-40	63,117				3,915
1938-39	59,764 (1)	94,873	...	8,794	3,769
1937-38	66,881 (1)	91,667	777	8,515	3,961
1936-37	69,542	79,391	829	8,479	3,040
1935-36	58,009	79,432	889	8,582	3,071
1934-35	64,239	64,722	860	8,253	3,334
1933-34	64,307	79,842	875	7,616	3,856
1932-33	65,476	81,735	779	8,096	3,481
1931-32	71,969	71,230	769	7,983	3,441

(1) Unofficial estimate

mated at 72,340,000 acres, a decrease of 1.4 per cent. on last season's record area of 73,375,000 acres but still 1.5 per cent. above the five-year average. The weather conditions, however, did not allow production to be as much

Imports into China

(in millions of pounds)

YEAR	Total	French Indochina	Thailand	Burma	Hong Kong
1939	706	215	300	37	15
1938	895	230	408	166	24
1937	762	405	243	111	1
1936	684	249	388	43	1
1935	2,858	1,662	756	(1) 426	2
1934	1,700	755	761	(1) 141	29
1933	2,856	1,249	1,007	(1) 560	25
1932	2,998	1,010	858	(1) 956	153

(1) Although the statistics for these years included India with Burma it may be assumed that practically the entire import was from Burma

above the previous very small crop as might have been expected and lowered it to 2.4 per cent. below the average this season's figure being 63,117 million pounds of white rice and derivatives. India will thus not draw so heavily on Burma's surplus as it did last year.

Reports of a return to average production in China after the very large crops of the last two seasons have not yet been confirmed.

The rice situation in the Japanese Empire is this year very seriously affected by the smallness of the crop in Chosen, which, due to severe drought in the past summer, amounted to only 4,699 million pounds of white rice and derivatives, a decrease of over 40 per cent. on last season's 7,902 million and one

Japanese Rice Supplies

(in millions of pounds of white rice and derivatives)

YEAR	Production in the Japanese Empire					Production in Manchukuo	YEAR	Net imports into Japan		Net exports of Chosen to foreign countries
	Japan	Chosen	Taiwan	Kwan- tung	Total			from Chosen	from foreign countries	
1939-40 ...	22,585	4,699	2,792	.	(1) 30,076	1,536	1940 ..	..	..	..
1938-39 ..	21,562	7,902	3,013	...	(1) 32,477	1,243	1939....	..	52	..
1937-38 ..	21,709	8,841	2,833	...	(1) 33,383	1,144	1938....	2,546	32	103
1936-37 ..	22,043	6,404	2,933	5	31,385	1,013	1937 ..	2,249	52	14
1935-36 ..	18,808	5,854	2,799	4	27,465	744	1936 ..	2,564	99	15
1934-35 ..	16,969	5,472	2,789	4	24,758	558	1935 ..	2,546	17	39
1933-34 ..	23,185	5,955	2,566	4	31,710	545	1934....	2,861 (*)	— 128	25
1932-33 ...	19,768	5,351	2,746	3	27,868	440	1933....	2,295	279	22
1931-32 ..	18,074	5,196	2,295	5	25,570	571	1932....	2,181	235	1

(1) Not including Kwantung — (2) Net export

of 28 per cent. on the five-year average. As Chosen is the chief source of rice imports into Japan and production in Taiwan, the only other important source within the Empire, was only 2,792 million pounds—the smallest since 1934-35—this means larger Japanese demands abroad, the 1939-40 crop in Japan itself being only 4 per cent. above average and the carryover on 1 November 1939 having been the smallest since 1918. Production continues to grow in Manchukuo and it is reported that Japan is once again drawing heavily on supplies from the Yangtze valley. Of the imports in 1939 from foreign countries 33 per cent. came from China, 64 per cent. from Thailand and 3 per cent. from French Indochina. Japan is reported to be already importing considerable quantities from Thailand, and it may also draw on part of Burma's surplus

Net Imports into the principal Asiatic markets, excluding Japan

(in millions of pounds of white rice and derivatives)

YEAR	Ind a (imports from Burma)	China	British Malaya	Ceylon	Netherlands East Indies	Philippines
1939 ...	(1) 4,748	690	1,889	1,357	482	..
1938 ..	(2) 2,838	894	1,760	1,187	631	20
1937 ..	3,202	715	1,593	1,164	239	159
1936 ..	4,003	625	1,478	1,194	407	201
1935 ..	3,789	2,844	1,339	1,234	802	10
1934 ..	5,177	1,685	1,293	1,088	571	(*) — 3
1933 ..	3,302	2,843	1,240	1,003	751	43
1932 ..	2,107	2,993	1,145	1,024	887	28

(1) Tel quel, to 27 December — (2) Tel quel, to 28 December — (3) Net export

Given the more or less normal surplus in the three major exporting countries and an Indian crop near average, the larger takings by Japan may compensate for possible decreases, due to war conditions in the absorption by Europe. Other Eastern countries may also compete more strongly for the available surplus, not only through building up emergency reserves but owing to rising prices for plantation and other products having the double effect of reducing the areas sown to rice and raising standards of living.

The combined effect of all these factors may thus be sufficient to outweigh the disturbance caused by the war in normal marketing and to maintain prices, taking the season as a whole, at a level not very different from that of the past season. It is only to be expected, however, that the uncertainties of the international situation and the resulting nervousness of the markets will superimpose considerable fluctuations above and below such an average level.

C. J. ROBERTSON.

CURRENT INFORMATION ON RICE.

Argentina The area sown to rice in 1939-40 is officially estimated at 82,000 acres, or slightly less than the record figure of last season. The decrease is due to a reduction in Corrientes, where excessive rain hampered sowing operations. Crop prospects vary from good to excellent.

Area and Production of Rice.

COUNTRIES	AREA				PRODUCTION OF ROUGH RICE														
	1939-40	1938-39	Average age 1933-34 to 1937-38	% 1939-40	1939-40	1938-39	Average 1933-34 to 1937-38	1939-40	1938-39	Average 1933-34 to 1937-38	% 1939-40								
												1938- 1939	Average age	1938 1939	Average age				
																= 100	= 100	= 100	= 100
ooo acres	ooo centials	ooo bushels of 45 lb																	
*Bulgaria	20	19	18	103.9	108.9	..	421	387	..	936	860	..	..				
Greece	6 ¹⁾	8 ¹⁾	3	77.8	189.1	..	209	47	..	464	103	47.5	213.3						
*Italy	366	367	344	99.8	106.5	..	18,043	15,984	..	40,094	35,519	..	..				
*Romania	1	1	—	118.6	—	..	..	—	..	41	—	..	..				
United States	1,039	1,076	899	96.6	115.5	23,538	23,628	19,741	52,306	52,506	43,868	99.6	119.2						
Burma	12,019	12,532	12,343	95.9	97.4	156,677	180,096	161,233	348,171	400,213	358,295	87.0	97.2						
Chosen	3,026	4,068	4,090	74.4	74.0	58,740	98,769	81,317	130,530	219,483	180,701	59.5	72.2						
French Indo- China:																			
Annam (first semester).	1,075	1,180	1,021	91.1	105.4	8,003	8,199	8,531	17,784	18,220	18,958	97.6	93.8						
Tonkin (5 th month)	..	1,205	1,186	..	..	14,897	14,727	13,216	33,103	32,726	29,368	101.2	112.7				
India *)	72,340	73,375	71,267	98.6	101.5	849,487	804,351	870,071	1,887,711	1,787,410	1,933,452	105.6	97.6						
Japan	7,823	7,893	7,828	99.1	99.9	282,316	269,518	256,785	627,356	598,918	570,622	104.7	109.9						
Manchukuo	..	862	597	..	..	19,196	15,530	10,011	42,657	34,511	22,246	123.6	191.8				
Taiwan	..	1,545	1,643	..	..	37,221	40,168	37,031	82,712	89,260	82,289	92.7	100.5				
Thailand	7,881	7,731	6,962	101.9	113.2	112,054	99,730	98,186	249,004	221,618	218,186	112.4	114.1						
Egypt:	568	495	419	114.8	135.5	19,572	15,988	12,427	43,493	35,528	27,615	122.4	157.5						
TOTALS	109,389	111,970	108,258	97.7	101.0	1,381,800	1,570,913	1,568,596	3,515,048	3,490,857	3,485,703	100.7	100.8						

* Not included in the totals — (1) Area sown — (2) Production in 1939-40 is officially estimated at over 17,600,000 centials or 29,200,000 bushels — (3) Final report — (4) First forecast

CURRENT INFORMATION ON POTATOES.

Area and Production of Potatoes.

COUNTRIES	AREA					PRODUCTION									
	1939 and 1939 40	1938 and 1938 39	Average 1933 to 1937 and 1933 34 to 1937 38	% 1939 and 1939 40	Average 1933 and 1938	1939 and 1939 40	1938 and 1938 39	Average 1933 to 1937 and 1933 34 to 1937 38	1939 and 1939 40	1938 and 1938 39	Average 1933 to 1937 and 1933 34 to 1937 38	% 1939 and 1939 40	Average 1933 and 1938	1939 and 1939 40	Average 1933 and 1938
	1939 40	1938 39	1933 34 to 1937 38	1939 and 1938 39	1933 and 1938	1939 40	1938 39	1933 34 to 1937 38	1939 40	1938 39	1933 34 to 1937 38	1939 and 1938 39	1933 and 1938	1939 40	Average 1933 and 1938
	ooo acres	ooo acres	ooo acres	= 100	= 100	ooo centals	ooo centals	ooo centals	ooo bushels of 60 lb	ooo bushels of 60 lb	ooo bushels of 60 lb	= 100	= 100	= 100	= 100
Albania	...	...	0	...	...	...	...	...	...	...	...	...	...	...	...
Germany ^(s)	335	428	2	78.1	100.9	38,361	44,754	12	63,933	74,558	12	85.7	110.9	...	...
Belgium	7,488	7,618	7,777	98.3	91.4	120,240	1,198,878	1,118,409	200,369	1,998,090	186,977	100.3	...	...	...
Bohemia-Moravia (Protecto rate)	363	364	398	99.7	...	...	71,836	71,759	...	119,725	119,596	...	...	...	...
Bulgaria	49	49	40	99.0	122.4	...	1,401	2,384	...	2,334	3,974	...	...	...	...
Denmark	168	196	190	85.9	88.5	24,912	31,586	28,793	41,520	52,642	47,988	78.9	86.5	...	...
Spain	1,006	...	1,127	...	89.3	...	...	...	...	...	184,534	...	...	...	...
Estonia	220	193	180	114.0	122.3	19,274	21,994	20,944	32,123	36,656	34,905	87.6	92.0	...	...
Finland	217	211	208	103.9	105.6	34,304	26,409	28,707	57,172	44,014	47,844	129.9	119.5	...	...
France	3,415	3,521	3,496	97.0	97.7	...	381,721	339,176	...	636,189	565,281	...	...	...	...
Greece	56	53	49	105.4	113.6	3,600	3,153	2,857	5,999	5,254	4,761	114.2	126.0	...	...
Hungary	4	720	720	...	...	52,131	47,193	47,758	86,883	78,653	76,261	...	...	...	...
Ireland	317	327	336	97.0	94.3	67,166	55,123	57,103	111,943	91,872	95,172	121.8	117.6	...	...
Italy	83	84	73	98.6	113.1	7,240	8,015	5,826	12,066	13,358	9,710	90.3	124.3	...	...
Latvia	959	956	971	100.3	98.8	...	57,000	54,251	...	94,998	90,417	...	...	...	...
Lithuania	359	340	288	105.5	124.7	36,525	38,611	33,964	60,873	64,350	56,606	94.6	107.5	...	...
Luxembourg	437	460	444	95.1	98.4	45,809	46,699	47,013	76,347	77,830	78,354	98.1	97.4	...	...
Malta	43	43	41	99.8	103.5	5,776	6,296	3,982	9,626	10,492	6,636	91.7	145.0	...	...
Norway	9	9	8	98.4	102.8	693	629	560	1,156	1,049	933	110.2	123.9	...	...
Netherlands for consumption, for starch	...	132	124	...	...	20,743	20,671	19,842	34,571	34,452	33,070	100.3	104.5	...	...
Poland	237	224	287	105.6	82.4	66,139	43,509	46,674	110,229	72,513	77,788	106.4	108.6	...	...
Portugal	71	76	61	93.5	116.1	...	18,672	14,219	...	31,119	23,697	...	...	...	...
Romania	7,562	7,487	7,039	101.0	107.4	...	761,881	744,303	...	1,269,777	1,240,480	...	...	...	...
single crop with maize	...	77	80	...	...	...	13,068	12,353	...	21,779	20,587	...	...	...	...
United Kingdom	512	476	515	107.6	99.5	40,778	36,695	39,902	67,962	61,157	66,503	111.1	102.2	...	...
England & Wales	244	226	226	107.9	107.7	3,059	3,027	3,373	5,096	5,046	5,621	101.0	90.7	...	...
Scotland	454	475	476	95.6	95.3	74,189	78,086	70,497	123,648	130,144	117,495	95.0	105.2	...	...
Northern Ireland	134	135	139	99.4	96.7	...	20,563	21,952	...	34,272	36,587	...	...	...	...
Sweden	115	123	133	93.2	86.8	...	15,935	19,761	...	26,558	32,914	...	...	...	...
Switzerland	336	338	327	99.4	103.0	41,189	41,283	41,708	68,648	68,803	69,513	99.8	98.8	...	...
Yugoslavia	125	123	116	101.2	107.2	14,683	17,882	16,760	24,471	29,802	27,933	82.1	87.6	...	...
via	...	658	635	...	...	...	37,515	34,594	...	62,524	57,556	...	...	...	...
U S S R	...	16,578	16,875	...	...	...	925,063	1,266,119	...	1,541,740	2,110,156	...	...	...	...
Canada	518	522	527	99.2	98.2	...	35,938	42,334	60,650	59,897	70,557	101.3	86.0	...	...
United States	3,032	3,023	3,359	100.3	90.3	216,595	224,497	223,440	360,992	374,163	372,401	96.5	96.9	...	...
Mexico	...	40	32	...	...	...	1,575	1,387	...	2,624	2,311	...	...	...	...
Cyprus	...	6	6	...	...	504	504	479	840	840	799	100.0	105.2	...	...
Japan	...	396	358	...	...	...	40,743	33,672	...	67,904	56,119	...	...	...	...
Palestine	2	2	2	107.3	122.6	230	193	89	383	322	148	119.0	258.1	...	...
Syria and Lebanon	...	19	18	...	...	...	918	885	...	1,530	1,475	...	...	...	...
Turkey	...	134	127	...	...	...	3,717	3,514	...	6,194	5,857	...	...	...	...
Algeria	22	17	17	125.7	131.1	1,370	1,470	995	2,284	2,450	1,658	93.2	137.7	...	...
Egypt	26	26	23	100.5	111.6	...	1,734	1,389	...	2,890	2,315	...	...	...	...
Tunisia	...	10	8	...	...	...	942	814	...	1,570	1,356	...	...	...	...
Argentina	...	7	5	100.0	147.1	...	121	152	...	202	254	...	...	...	...
Chile	...	309	296	...	...	...	15,704	14,728	...	26,172	24,546	...	...	...	...
Union of South Africa	...	134	126	...	...	...	10,728	10,142	...	17,879	16,903	...	...	...	...
New Zealand	...	...	85	...	...	...	3,811	3,424	...	6,352	5,706	...	...	...	...
	20	18	23	109.8	85.0	...	1,964	2,842	...	3,273	4,736	...	...	...	...

(s) Early potatoes. — (t) Late potatoes. — (1) Including Ostmark and Sudetenland. — (2) Average 1932 to 1937. — (3) Average 1933-1935. — (4) Including the northern region annexed by Hungary, but not including Sub-Carpathian Russia. — (5) Territory at the end of 1937. — (6) Average 1935 to 1937. — (7) Area provided for by the Plan.

Greece: Favoured by the fine and rather mild weather of February, potato planting began in the warmer districts. An extensive use has been made this year of selected seeds supplied by the special centre for the production and distribution of seeds. An extension in acreage, which had been forecast for this year, was assured by the import from Ireland of potato seeds.

Argentina. The lifting of early potatoes in February made good progress in the principal growing areas, with yields varying from average to good. The crop condition of main season varieties was generally satisfactory.

THE BEET AREAS IN 1940

As in former years the Institute has addressed an enquiry to Governments and the organizations concerned on the probable area of beet sowings in 1940. Few replies have been received so far, mainly because a number of countries, including some which are not at war, no longer publish agricultural information and because the season is late. Other countries have intimated that they will shortly issue their reports. A complete outline of the beet sowings cannot consequently be given. Such information as is available is given below.

The Price Information Office of the Swiss Farmers' Union reports that this year's beet area will be 8,400 acres compared with 8,900 acres in 1939.

The Consorzio Nazionale produttori zucchero indicates that the beet area in Italy in 1940 is expected to reach 408,000 acres compared with 370,000 acres in 1939. This area includes that intended for the production of fuel alcohol.

The quota of sugar production in France for this year has been put at 23,424,000 centals (1,171,000 short tons), an increase of more than 10 per cent. on the quantity actually obtained in 1939-40. The growers have consequently been asked to produce the largest possible quantity by the Confédération Générale des planteurs de betteraves and by the Comité Central des fabricants de sucre.

In Belgium an increase in the area of 9 per cent. on last year is expected.

Only partial information is available on other countries but it is hoped that next month it will be possible to have data for most of the European beet growing countries and thus to publish a complete table.

CURRENT INFORMATION ON SUGAR.

U. S. S. R. In Ukraina, where the area under sugar-beet represents 68.3 per cent. of the total area under this crop in the Soviet Union, the average yield per acre in 1939 was 128 centals (6.4 short tons), against 143 centals (7.1 short tons) in 1938; the yield per acre in the various districts was very variable in 1939, varying from a minimum of 86 centals (4.3 short tons) per acre in Kirovogradsk to a maximum of 180 centals (9.0 short tons) in Kamenez-Podolsk.

The low yields in 1939 are to be attributed to drought, particularly during the growing season, and to insect infestation, which was much more severe in 1939 than in 1938. The number of beets per acre during lifting averaged 20,300 in Ukraina as a whole, whereas in a good season they would amount to 40,000.

Production of Beet-Sugar (raw).

COUNTRIES	PRODUCTION (Sept. 1 - February 29)		TOTAL PRODUCTION DURING THE SEASON			% 1939-40	
	1939-40	1938-39	1939-40 (1)	1938-39	Average 1933-34 to 1937-38	1938-39	Average
	thousand centals					= 100	= 100
Germany . . . . .	...	...	2) 50,791	46,959	42,760	108	119
Bohemia-Moravia . . . . .	...	...	10,278	11,585	14,167	99	81
Slovakia . . . . .	...	...	1,184	...	...	...	...
Belgium . . . . .	...	...	5,953	4,244	5,400	140	110
Bulgaria . . . . .	...	...	772	476	441	162	175
Denmark . . . . .	...	...	5,357	4,026	4,491	133	119
Spain . . . . .	...	...	2,447	1,984	5,051	123	48
Finland . . . . .	...	...	331	337	213	98	155
France . . . . .	...	...	22,779	18,426	21,836	124	104
Hungary . . . . .	...	...	2,877	2,807	2,765	103	104
Ireland	3) 1,436	3) 1,336	1,436	1,334	1,705	108	84
Italy . . . . .	...	...	10,296	8,768	7,415	117	139
Latvia . . . . .	...	...	882	816	1,024	108	86
Lithuania	3) 529	3) 458	600	458	447	131	134
Netherlands . . . . .	...	...	5,181	4,521	5,323	115	97
Poland . . . . .	...	...	9,480	12,037	9,933	79	95
Romania . . . . .	...	...	3,748	3,682	2,444	102	153
United Kingdom . . . . .	...	...	12,103	7,407	12,036	163	101
Sweden . . . . .	...	...	6,746	6,446	6,687	105	101
Switzerland . . . . .	...	...	326	287	212	114	154
Yugoslavia . . . . .	...	...	2,646	1,896	1,612	140	164
<i>Total Europe (a)</i> . . . . .	...	...	156,213	138,496	145,962	113	107
U. S. S. R. . . . .	...	...	52,911	48,502	39,431	109	134
<i>Total Europe (b)</i> . . . . .	...	...	209,124	186,998	185,393	112	113
Canada	—	—	1,852	1,626	1,459	114	127
United States	—	—	34,390	36,059	28,158	95	122
<i>Total North America</i>	—	—	36,242	37,685	29,617	96	122
Japan	—	—	689	1,096	873	63	79
Manchukuo	—	—	...	463	129	...	...
Turkey	—	—	2,315	1,042	1,449	222	160
<i>Total Asia</i>	—	—	3,004	2,138	2,322	141	129
GENERAL TOTALS (a)	—	—	195,459	178,319	177,901	110	110
GENERAL TOTALS (b)	—	—	248,370	226,821	217,332	110	114

(a) Not including U. S. S. R. — (b) Including U. S. S. R. — (1) Approximate data. — (2) Licht's estimate. — (3) Production to the end of January.

Seeing that the area under sugar-beet in the Union as a whole in 1939 was 2,928,000 acres, that of Ukraina (68 3 per cent.) would be about 2,000,000 acres and the total production of Ukraina about 254,000,000 centals (12,700,000 short tons)

Argentina. The condition of sugar-cane plantations at the beginning of February was excellent, in spite of the heavy rain which has retarded the operations. According to the latest reports, the production of cane this season will be large, exceeding that of 1938-39.

Netherlands Indies: Java and Madura; Rainfall in the first half of February was rather light in most plantations. The condition of the cane is considered satisfactory, although on a number of plantations there are still visible the effects of the unfavourable conditions in which first growth took place and in many cases the cane is rather short.

In the second half of February, on the other hand, the weather was rather wet with local floods. Condition remained more or less unchanged (*Aneta*).

Area and Production of Sugar-Beet.

COUNTRIES	AREA					PRODUCTION											
	1939	1938	Average 1933 to 1937	% 1939		1939	1938	Average 1933 to 1937	1939	1938	Average 1933 to 1937	% 1939					
				1938	Average							1938	Average				
														= 100	= 100	= 100	= 100
ooo acres					ooo centals				ooo short tons								
Germany (1) .	1,402	1,394 (2)	1,037	100.6	135.4	383,385	379,196	274,476	19,169	18,960 (2)	13,724	101.1	129.7				
Belgium. . .	134	122	126	109.6	106.2	...	26,492	33,546	...	1,325	1,677	..	...		
Bohemia-Moravia (Protect.) . .	289	287	—	100.5	—	—	—	—	—	—	—	—	—				
Bulgaria . . .	29	29	18	99.4	158.3	...	2,834	3,346	...	142	167	...	...		
Denmark (3) .	95	94	101	100.8	93.8	35,054	30,049	35,188	1,753	1,502	1,759	116.7	99.6				
Finland (4) .	14	13	7	112.9	193.7	2,123	2,885	1,750	106	144	87	73.6	121.3				
France (5) . .	(6) 824	787	784	104.3	105.0	...	176,037	195,304	...	8,802	9,765	...	...		
Hungary . . .	(7) 130 (8)	109 (8)	114	—	—	(7) 23,840 (8)	21,372 (8)	21,043 (7)	1,192 (8)	1,069 (8)	1,052	...	...		
Ireland . . .	42	51	48	81.4	86.4	9,192	9,329	11,172	460	466	559	98.5	82.3				
Italy	368	336	256	109.8	144.0	...	71,723	58,499	...	3,586	2,925	...	...		
Latvia . . . .	...	34	34	...	...	...	5,085	5,916	...	255	296	...	...		
Lithuania . .	22	20	15	108.0	141.3	3,755	3,166	2,819	188	158	141	118.6	133.2				
Netherlands .	113	108	106	105.1	106.1	37,258	33,499	37,393	1,863	1,675	1,870	111.2	99.6				
Poland . . . .	...	372	296	...	...	...	69,720	56,087	...	3,846	2,804	...	...		
Romania . . .	132	117	87	112.3	151.7	18,849	16,116	12,689	942	806	635	117.0	148.5				
Unit. King: Engl. and W. Scotland . . .	337	329	356	102.5	94.6	...	47,936	74,238	...	2,397	3,712	...	...		
Sweden	7	7	6	101.5	121.9	...	1,411	1,297	...	71	65	...	...		
Switzerland . .	125	125	128	100.0	98.2	41,885	40,430	41,638	2,094	2,021	2,082	103.6	100.6				
Yugoslavia . .	9	7	4	122.0	204.0	2,425	2,050	1,521	121	103	76	118.3	159.4				
Turkey	114	73	69	156.4	164.9	...	12,290	11,002	...	614	550	...	...		
U.S.S.R. . . .	9) 2,928	2,917	2,999	100.4	97.6	463,343	367,732	331,786	23,167	18,386	16,589	126.0	139.7				
Canada	61	48	51	128.4	121.6	12,100	10,540	9,466	605	527	473	114.8	127.8				
U.S.A.	921	930	809	99.0	113.8	213,820	232,300	177,076	10,691	11,615	8,854	92.8	120.8				
Turkey . . . .	...	52	63	...	...	...	6,054	8,326	...	303	416	...	...		

(1) Including Ostmark and Sudetenland. — (2) Average 1932 to 1937. — (3) Not including crops for seed. — (4) Sugar-beet for factories. — (5) Including beets for distilling. — (6) Estimated on June 1. — (7) Present frontiers excluding Sub-Carpathian Russia. — (8) Territory at the end of 1937. — (9) Calculated.

Palestine: According to the most recent estimate, the area cultivated to sugar-beet in 1939 was 300 acres. The corresponding production is estimated at about 65,800 cents (3,300 short tons)

Egypt: The cutting of sugar-cane and despatch to factories are in progress in Upper Egypt and the province of Minya. The yield per acre is normal. Preparation of the land for planting of cuttings is in progress and early cultivation is proceeding

Production of Cane-Sugar.

COUNTRIES	1939-40 (1)	1938-39	Average of 1933-34 to 1937-38	1939-40 (1)	1938-39	Average of 1933-34 to 1937-38	% 1939-40	
	ooo centals			short tons			1938-39 = 100	Average = 100
AMERICA								
Antigua	304	493	514	15,200	24,640	25,688	62	59
Argentina	11,288	10,141	8,147	564,000	510,000	407,341	111	139
Barbados	2,866	3,505	2,517	140,000	175,250	125,843	82	114
Brazil	26,896	25,353	23,161	1,340,000	1,270,000	1,158,050	106	116
Cuba	62,567	61,730	57,752	3,128,000	3,100,000	2,887,585	101	108
Ecuador	540	489	413	27,000	24,500	20,657	110	131
United States (La. & Fl.)	10,362	11,601	7,187	520,000	580,000	359,350	89	144
British Guiana	4,299	4,189	3,978	215,000	210,000	198,899	103	108
Jamaica	2,608	2,642	2,086	130,400	132,100	104,278	99	125
Martinique	1,323	1,433	1,104	70,000	72,000	55,206	92	120
Mexico	6,834	7,772	6,037	340,000	388,602	301,854	88	113
Peru	8,686	8,157	8,702	434,000	410,000	435,102	106	100
Puerto Rico	22,046	17,637	18,515	1,000,000	900,000	925,750	125	119
Dominican Republic	9,921	9,502	9,030	500,000	475,000	451,494	104	110
St Kitts	584	836	659	29,200	41,816	32,944	70	89
Trinidad	2,866	2,877	2,983	140,000	143,870	149,129	100	96
Venezuela	551	540	489	28,000	27,000	24,472	102	113
Total America	174,541	168,897	153,274	8,620,800	8,484,778	7,663,642	103	114
ASIA								
Taiwan	28,660	32,915	19,895	1,430,000	1,646,000	994,719	87	144
India	61,112	45,534	59,190	3,056,000	2,276,700	2,959,455	134	103
Japan	3,386	3,596	2,359	169,300	179,800	117,951	94	144
Java	35,274	34,392	19,839	1,800,000	1,720,000	991,927	103	178
Philippines	24,912	22,708	23,455	1,230,000	1,140,000	1,172,739	110	106
Total Asia	153,344	139,145	124,738	7,705,300	6,962,500	6,236,791	110	123
AFRICA								
Egypt	3,417	3,573	3,190	171,000	178,634	159,001	96	107
Mauritius	5,534	7,084	5,886	277,000	354,180	294,310	78	94
Reunion	1,764	1,764	1,745	90,000	90,000	87,267	100	101
Union of South Africa	11,464	11,616	9,426	570,000	580,800	471,280	99	122
Total Africa	22,179	24,037	20,237	1,108,000	1,203,614	1,011,858	92	110
OCEANIA.								
Australia	19,842	18,298	15,933	1,000,000	910,000	796,647	108	125
Hawaii	19,070	19,158	18,961	953,000	958,000	948,051	100	101
Fiji Islands	2,844	2,853	2,912	142,000	142,600	145,602	100	98
Total Oceania	41,756	40,309	37,806	2,095,000	2,010,600	1,890,300	104	110
TOTALS	391,820	372,388	336,055	19,529,100	18,661,492	16,802,591	105	117

(1) Approximate data.

in Qena, while normal cultivation is beginning in Aswan. Field operations (hoeing, manuring and irrigation) are being carried out in old plantations.

Union of South Africa. The weather in the sugar-cane belt in January was exceptionally dry and very warm. Rainfall varied from $\frac{1}{2}$ to 5 inches. Crop condition averaged 5 per cent. below normal.

CURRENT INFORMATION ON VINES.

France: The extremely severe winter did not damage vines. Work in the vineyards, however, has been delayed by the unfavourable weather.

The Inter-ministerial Commission on Viticulture has officially estimated wine production in 1939 at 1,892,000,000 Imperial (2,272,000,000 American) gallons, which is a considerably higher figure than that of 1938 (1,760 or 2,113 million gallons) and the preceding five-year average (1,320 or 1,585 million gallons) [*Bulletin of the International Wine Office*, January-February 1940].

Argentina: In spite of the damage caused by hail in a number of vineyards in Mendoza, the production of grapes in this province which is the principal viticultural centre of the country, is reported as large this year. Prospects are also good in the Río Negro valley. In several districts of Buenos Aires, Santa Fe and Córdoba vineyards were damaged by frost. In February the vintage was in full swing in Salta, San Juan, La Rioja, Jujuy and Catamarca with generally good results.

Algeria: Weather conditions were not too unfavourable in February and vines began to sprout in the first decade of March.

CURRENT INFORMATION ON OLIVES.

Greece: The production of olive oil in 1939-40 is estimated at 3,422,700 centals (45,635,500 American gallons) against 2,068,600 (27,581,500) in 1938-39 and an average of 2,540,500 (33,872,600) in 1933-34 to 1937-38, percentages, 165.5 and 134.7.

The production of Table olives in 1939-40 is estimate at 1,751,100 centals against 510,600 in 1938-39 and an average of 784,200 in 1933-34 to 1937-38, percentages, 342.9 and 223.3.

Argentina. The condition of olives in February was generally satisfactory in the principal producing regions. The crop is reported as good in La Rioja and average in Catamarca.

Palestine: According to the most recent estimate, the area cultivated to olives in 1939 was 55,000 acres against 54,600 in 1938 and 48,000 on the average of the five years ending 1937, percentages 100.7 and 114.6. The corresponding production of olives is estimated at about 307,000 centals against 850,000 and 522,000, percentages 40.7 and 76.1. The corresponding production of olive oil is estimated at about 66,100 centals (882,000 American gallons) against 170,100 (2,268,000) and 102,800 (1,370,000); percentages 38.9 and 64.4.

CURRENT INFORMATION ON FLAX.

Hungary: Winter flax crops were considerably damaged by the severe winter.

Romania: The five-year agricultural plan which will begin this spring is expected to result in an appreciable expansion in the flax and hemp crops cultivated for seed and fibre.

Area and Production of Flax.

COUNTRIES	† AREA					† PRODUCTION							
	1939 and 1939-40	1938 and 1938-39	Aver. 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40		1939 and 1939-40	1938 and 1938-39	Aver. 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40	1938 and 1938-39	Aver. 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40	
				1938 and 1938- 1939	Aver- age							1938 and 1938/ 1939	Aver. = 100
	ooo acres					ooo centals			ooo lb.				
<i>Fibre.</i>													
Germany (¹).	144	136 ^{a)}	73	105.6	—	...	661 ^{a)}	449	...	66,139 ^{a)}	44,908	...	...
Belgium . . .	110	77	58	143.5	189.6	...	781	356	...	78,064	35,593	...	...
Bohemia- Moravia (Pr.)	11	10	—	116.0	—	—	—	—	—	—	—	—	—
Bulgaria . . .	9	8	5	117.9	175.3	...	6	6	...	604	619	...	...
Estonia . . .	57	58	63	98.5	90.8	135	168	184	13,482	16,798	18,396	80.3	73.3
Finland (¹) . .	8	7	11	104.7	72.5	...	22	33	...	2,218	3,336	...	...
France . . .	...	94	69	...	...	...	525	392	...	52,493	39,180	...	...
Hungary . . .	^{a)} 10	8 ^{a)}	8	...	...	^{a)} 47	35 ^{a)}	31 ^{a)}	4,718	3,463 ^{a)}	3,088	...	...
Ireland . . .	4	4	3	105.3	118.9	19	15	15	1,899	1,460	1,537	130.1	123.6
Italy . . .	^{a)} 37 ^{a)}	30 ^{a)}	24	125.4	154.0	...	80	51	...	7,974	5,091	...	...
Latvia . . .	152	162	144	94.0	105.4	...	473	419	...	47,316	41,901	...	...
Lithuania (¹)	205	192	183	106.6	112.2	629	568	588	62,898	56,844	58,760	110.7	107.0
Netherlands .	62	51	25	120.4	243.7	390	429	197	39,048	42,935	19,671	90.9	198.5
Poland . . .	...	365	298	...	...	...	872	761	...	87,229	76,113	...	...
Romania . . .	30	37	62	80.2	48.3	126	140	194	12,596	13,950	19,361	90.3	65.1
Un Kingd. N. Ireland	21	21	20	103.2	108.5	...	90	98	...	9,041	9,838	...	...
Yugoslavia . .	...	35	30	...	...	...	285	236	...	28,478	23,617	...	...
U. S. S. R. (¹)	...	4,650	5,351	...	...	13,963	12,037	12,266	139,324	1,203,728	1,226,634	116.0	113.8
Japan . . .	...	62	37	...	...	...	194	98	...	19,382	9,798	...	...
Egypt . . .	10	9	5	109.5	192.8	81	71	34	8 142	7,071	3,433	115.1	237.2

Linseed.

	ooo bushels of 56 lb.												
*Germany (¹)	144	136 ^{a)}	73	105.6	—	...	522 ^{a)}	454	...	933 ^{a)}	810	...	...
*Belgium . . .	118	77	58	143.5	189.6	...	355	263	...	634	470	...	...
*Bohemia- Moravia (Pr.)	11	10	—	116.0	—	—	—	—	—	—	—	—	—
*Bulgaria . . .	9	8	5	117.9	175.3	...	18	22	...	32	40	...	...
Estonia . . .	57	58	63	98.5	90.8	152	196	195	271	350	348	77.3	77.8
*France . . .	...	94	69	...	...	...	...	239	...	...	426	...	...
Hungary . . .	¹) 18	21 ^{a)}	21	...	...	¹) 138	154 ^{a)}	113 ^{a)}	246	276 ^{a)}	201	...	...
*Italy . . .	³) 37 ^{a)}	30 ^{a)}	24	125.4	154.0	...	147	68	...	263	121	...	...
Latvia . . .	152	162	144	94.0	105.4	...	532	450	352	949	803	699	118.2
Lithuania (⁴)	205	192	183	106.6	112.2	703	650	695	1,255	1,161	1,240	108.1	101.2
*Netherlands .	62	51	25	120.4	243.7	...	364	170	...	649	304	...	...
Poland . . .	...	365	298	...	...	...	1,508	1,403	...	2,692	2,506	...	...
Romania . . .	30	37	62	80.2	48.3	115	122	230	205	217	411	94.4	49.9
*Yugoslavia .	—	—	—	...	...	...	30	25	...	53	44	...	...
Total Europe	462	470	473	98.9	97.9	1,640	1,572	1,625	2,926	2,807	2,899	104.3	100.9
*U. S. S. R. (¹)	...	5,605	6,030	...	...	...	...	15,952	...	...	28,486	...	...
Canada . . .	307	221	299	138.8	102.6	1,215	705	647	2,169	1,259	1,156	172.3	187.7
United States.	2,284	936	1,298	244.0	175.9	11,385	4,565	4,418	20,330	8,152	7,889	249.4	257.7
*Mexico . . .	...	12	12	...	...	...	48	51	...	85	90	...	...
Total N. Am.	2,591	1,157	1,597	223.5	162.2	12,600	5,270	5,065	22,499	9,411	9,045	239.0	248.7
India . . .	3,894	3,890	3,428	100.1	113.6	9,968	10,326	8,982	17,800	18,440	16,040	96.5	111.0
Egypt . . .	10	9	5	109.5	192.8	59	61	39	106	108	69	97.5	153.7
*Fr. Morocco .	...	56	41	...	...	...	112	165	...	201	294	...	...
Argentina . . .	¹¹) 7,600	¹¹) 6,608	¹¹) 7,198	115.0	105.6	24,846	31,085	37,920	44,368	55,510	67,714	79.9	65.5
Uruguay . . .	546	452	332	120.7	164.6	2,628	2,478	1,795	4,693	4,425	3,205	106.0	146.4
Totals . . .	15,103	12,586	13,033	120.0	115.9	51,741	50,792	55,416	92,392	90,701	98,972	101.9	93.4

† The years indicated are those of the harvest, single years referring to the Northern Hemisphere, double years to the Southern. — * Not included in the totals. — (1) Including Ostmark and Sudetenland. — (a) Not including Sudetenland — (3) Flax and hemp. — (4) Present frontiers excluding Sub-Carpathian Russia. — (5) Average 1934 to 1937. — (6) Total area (for fibre and for seed). — (7) Dolgunetz variety. — (8) Dolgunets and Kudriash varieties. — (9) Area according to the Plan. — (10) Average 1933 to 1935. — (11) Area sown.

United Kingdom: The Government has made arrangements for a considerable extension of the flax acreage in England and Scotland in 1940. Contracts are to be made at a fixed price between farmers and processing factories. New factories will also be constructed.

The fibre produced will be unretted or "green" fibre, which has not hitherto found much favour in any country, but which, it is now claimed, can be used for the manufacture of heavy linen goods. It has been decided that, where the land is suitable and a definite contract for flax has been made, the £2 an acre grant for ploughing up new land will be extended to this crop.

United States: The Crop Reporting Board estimates on the basis of farmers' reports on their planting intentions that the area to be sown to linseed this year will be about 2,836,000 acres. This would be 14.8 per cent. more than the area planted last year (2,470,000 acres) and 58.6 per cent. above the average of the years 1934 to 1938 (1,788,000).

India: The condition and prospects of the linseed crops were reported in the latter part of January to be fairly good on the whole. In the Central Provinces, which are the principal producer, light rain fell in the fortnight ending February 24. Crop condition was then satisfactory.

CURRENT INFORMATION ON COTTON.

Greece The improvement of the weather in February enabled the intensification of preparations for cotton sowing. It is anticipated that, in view of the international situation, a widespread campaign for increasing cotton production will be conducted. The advice given by the Government to growers to purchase in good time the necessary machines and selected seeds has already had satisfactory results and will greatly stimulate the extension of cotton growing.

Romania An appreciable increase in the cotton area is expected.

U. S. S. R. According to regulations of the Government on February 20, a series of measures will be taken in Turkmenistan, which is the principal cotton growing region of the Union, in order to extend the cultivation of cotton, and at the same time increase the unit yields. The necessary funds have been assigned. A considerable increase in irrigation works is provided for, the introduction of a more rational crop rotation, the use of a larger number of machines, the intensification of manuring, etc. Under the new measures the Republic of Turkmenistan will become the centre in the Union for the cultivation of good quality Egyptian cotton. In 1939 the area cultivated to Egyptian cotton in Turkmenistan amounted 98,200 acres and the unit yield in that year was 1,133 lb. per acre of unginned cotton, representing an increase of 5.5 times over 1930. For American cotton the unit yield in 1939 was 1,624 lb., or 2.8 times as large as that of 1930. By these measures it is hoped to increase considerably in the next few years unit yields, raising them by 1945 to 1,520 lb. of unginned cotton for Egyptian varieties and to 2,360 lb. for American varieties.

Argentina: Weather conditions in the first week of March were favourable. Cotton picking was in full swing. Ginning is in progress with good results both qualitatively and quantitatively.

United States:

Summary of the Cotton Reports issued by the Government of the United States, during the cotton season (August 1-July 31).

	Provisional estimates for dates indicated 1939-40	Final estimates		Percent. 1939-40		
		1938-39	Average 1933-34 to 1937-38	1938-39 = 100	Aver. = 100	
Report referring to July 1:						
Area in cultivation (acres)	24,943,000	25,018,000	32,178,000	99.7	77.5	
Report referring to August 1:						
Area left for harvest (acres) (1)	24,424,000	(2) 24,248,000	(2) 29,427,000	100.7	83.0	
Crop condition (per cent. of normal)	74	78	70	—	—	
Production (4)	11,412,000	11,944,000	12,933,000	95.5	88.2	
Yield of lint per acre, in lb.	223.7	235.8	(3) 190.8	94.9	117.2	
Cotton ginned to August 1 (5)	137,076	157,865	100,900	86.8	124.7	
Cotton ginned to August 16 (5)	309,677	314,616	370,885	98.4	83.5	
Report referring to September 1:						
Area left for harvest (acres) (6)	24,222,000	(2) 24,248,000	(2) 29,427,000	99.9	82.3	
Crop condition (per cent. of normal)	70	65	(3) 61	—	—	
Production (4)	12,380,000	11,944,000	12,933,000	103.6	95.7	
Yield of lint per acre, in lb.	244.7	235.8	(3) 190.8	103.8	128.4	
Cotton ginned to September 1 (5)	1,402,970	1,335,643	1,436,526	105.0	97.7	
Cotton ginned to September 16 (5)	3,876,616	3,634,922	3,303,775	106.6	117.3	
Report referring to October 1:						
Crop condition (per cent. of normal)	68	66	(3) 61	—	—	
Production (4)	11,928,000	11,944,000	12,933,000	99.9	92.2	
Yield of lint per acre, in lb.	235.7	235.8	(3) 190.8	100.0	123.5	
Cotton ginned to October 1 (5)	6,686,712	6,577,109	5,878,909	101.7	113.7	
Cotton ginned to October 18 (5)	8,877,681	8,925,828	8,314,616	99.5	106.8	
Report referring to November 1:						
Production (4)	11,845,000	11,944,000	12,933,000	99.2	91.6	
Yield of lint per acre, in lb.	234.1	235.8	(3) 190.8	99.3	122.7	
Cotton ginned to November 1 (5)	10,080,535	10,124,773	9,811,853	99.6	102.7	
Cotton ginned to November 14 (5)	10,683,371	10,742,579	10,806,724	99.4	98.9	
Report referring to December 1:						
Area in cultivation, on July 1 (acres)	24,832,000	25,018,000	32,178,000	99.3	77.2	
Area left for harvest (acres) (7)	23,928,000	(2) 24,248,000	(2) 29,427,000	98.7	81.3	
Production (4)	11,792,000	11,944,000	12,933,000	98.7	91.2	
Yield of lint per acre, in lb.	235.9	235.8	(3) 190.8	100.0	123.6	
Average gross weight of running bale, lb. (8)	514.0	513.8	(3) 511.2	100.0	100.5	
Cotton ginned to December 1 (5)	11,111,422	11,230,522	11,630,355	98.9	95.5	
Cotton ginned to December 13 (5)	11,275,550	11,412,139	11,957,256	98.8	94.3	
Cotton ginned to January 16 (5)	11,404,924	11,552,913	12,356,445	98.7	92.3	
Report of March 20:						
Total ginmings throughout the season (5)	11,477,133	11,632,221	12,589,968	98.7	91.2	
Equivalent cotton ginned (4)	11,812,281	11,944,340	12,933,224	98.9	91.3	
Average gross weight of running bale, lb. (8)	514.6	513.8	(3) 511.2	100.1	100.6	
Total number of running bales, excl. linters	11,564,703	11,702,270	12,760,759	98.8	90.6	
Including: Sea Island	2,170	4,300	1,026	50.5	211.5	
American-Egyptian	26,824	20,503	13,979	130.8	191.9	
Upland: Round bales	175,140	157,979	341,582	110.9	51.3	
Upland: Square bales	11,360,569	11,519,428	12,404,172	98.6	91.6	
Linters: running bales . . . . .	...	1,113,312	1,015,845	...	...
Linters equiv. 500-pound bales, net weight . . . . .	...	1,329,208	1,214,933	...	...
Number of gineries: total . . . . .	...	13,998	14,598	...	...
Number of gineries operated	11,884	12,279	12,896	96.8	92.2	
Average number of bales ginned per active establishment (5)	966	947	976	102.0	98.9	

(1) Area in cultivation on July 1 less the ten-year (1929-38) average abandonment, about 2.2 per cent. — (2) Area actually harvested. — (3) Ten-year (1928-37) average. — (4) In bales of 478 lb. net weight and exclusive of linters. — (5) In running bales, counting round bales as half bales and exclusive of linters. (6) Per cent. of the acreage in cotton on July 1, 1939, which has been, or will be, abandoned: 2.9, compared with 4.1 in 1938. — (7) Per cent. of the acreage in cotton on July 1, 1939, which has been abandoned: 3.6. — (8) Counting round bales as half bales and exclusive of linters.

Area and Production of Cotton.

COUNTRIES	AREA						PRODUCTION OF GINNED COTTON								
	1939-40	1938-39	Average 1933-34 to 1937-38	% 1939-40		Average 1939- 1937-38	1939- 1940	1938- 1939	Average 1933-34 to 1937-38	1939- 1940	1938- 1939	Average 1933-34 to 1937-38	% 1939-40		
				1938- 1939	Average age								1938- 1939	Average age	
ooo acres			= 100 = 100			ooo cents			ooo bales of 478 lb.			= 100 = 100			
*Bulgaria	166	136	78	122	212	6	...	153	138	...	32	29	...	...
Greece	190	187	121	101	7	156	299	321	240	63	67	50	93.2	124	9
*Italy . . . . .	...	91	20	...	...	...	...	209	37	...	44	8	...	...	...
Romania	17	12	3	139.8	508	0	29	13	5	6	3	1	227	8	548.1
*Yugoslavia	14	14	4	100	3	312	...	27	7	...	6	1	...	...	...
U. S. S. R.	5,190	5,147	4,977	100.8	104.3	...	19,400	18,500	12,900	4,050	3,870	2,707	104	8	149.9
United States (1)	23,928	24,248	29,427	98.7	81	3	56,463	57,094	61,821	11,812	11,944	12,935	98	9	91
*Br. West Indies . . . . .	...	22	17	...	...	...	...	21	19	...	4	4	...	...	...
*Mexico . . . . .	...	633	623	...	...	...	...	1,462	1,405	...	306	294	...	...	...
*Argentina	(2) 903	(1) 1,005	(2) 832	89	8	108	...	1,563	1,195	...	327	250	...	...	...
Brazil: North	2,350	2,224	2,295	105	6	102	3,307	3,064	3,293	692	641	689	107	9	100.4
*: South . . . . .	...	3,700	2,461	...	...	...	...	5,861	4,297	...	1,226	899	...	...	...
*Peru . . . . .	...	395	377	...	...	...	...	1,912	1,696	...	400	355	...	...	...
Burma	(2) 365	(2) 411	(2) 494	88.8	73	9	392	426	451	82	89	94	92	1	86
*China (3) . . . . .	...	...	7,319	...	...	...	...	...	14,283	...	...	2,988	...	...	...
*Cyprus . . . . .	...	9	11	...	...	...	8	8	11	2	2	2	97	7	67.2
*Chosen	622	577	506	107	3	123	874	894	845	183	187	177	97.7	103	5
India (4)	21,052	23,348	24,631	90	2	85	18,328	20,196	22,188	3,834	4,225	4,642	90	8	82.6
do. (5) . . . . .	...	(23,553)	(24,630)	...	...	...	...	(20,480)	(22,049)	...	(4,285)	(4,613)	...	...	...
*Iraq . . . . .	...	79	45	...	...	...	...	58	29	...	12	6	...	...	...
*Japan . . . . .	...	2	2	...	...	...	...	4	3	...	9	7	...	...	...
*Svria	103	93	64	110	8	161	...	185	96	...	39	20	...	...	...
*Turkey . . . . .	...	680	559	...	...	...	...	1,462	1,030	...	306	215	...	...	...
*Belgian Congo . . . . .	...	980	752	...	...	...	...	772	615	...	161	129	...	...	...
Egypt	1,687	1,852	1,848	91	1	91.3	8,677	8,260	8,871	1,815	1,728	1,856	105	0	97.8
*Kenya . . . . .	...	...	...	...	...	...	...	40	58	...	8	12	...	...	...
*Nigeria (6) . . . . .	...	...	...	...	...	...	...	...	(7) 156	...	...	(7) 33	...	...	...
*Nyasaland . . . . .	...	92	71	...	...	...	...	49	47	...	10	10	...	...	...
Uganda	1,574	1,530	1,377	102.9	114	2	(8) 1,380	(8) 1,208	(5) 1,281	(8) 289	(8) 253	(8) 268	114	2	107
Anglo-Eg Sudan	427	458	402	93.1	106.2	...	...	1,115	1,258	1,077	233	263	225	88	6
*Tanganyika . . . . .	...	...	...	...	...	...	(9) 314	(8) 199	(8) 195	(9) 66	(8) 42	(8) 41	...	...	...
*Union of S. Africa . . . . .	...	...	...	...	...	...	...	3	10	...	1	4	...	...	...
Total	57,402	59,994	66,081	95.7	86.9	...	110,264	111,234	112,972	23,059	23,270	23,642	99.1	97.6	...

* Not included in the total

(1) See *Summary of Cotton Reports*. — (2) Sown area. — (3) According to the Chinese Cotton Statistics Association, Shanghai. — (4) Fourth Report, covering the entire cotton area of India. — (5) Final estimates. That of last year is subject to revision. — (6) Northern Provinces. — (7) Cotton lint bought, American variety only. — (8) Exports. — (9) Quantities available for export.

India (Telegram of February 22). According to the final estimate, the area cultivated to cotton in the Punjab in 1939-40 was 3,298,000 acres, against 3,653,000 in 1938-39 and 3,422,600 on the average of the five years ending 1937-38; percentages, 90.3 and 96.4. The corresponding production is estimated at 4,004,000 cents (1837,700 bales of 478 lb.), against 4,968,000 (1,030,300) and 5,040,800 (1,054,600), percentages, 80.6 and 79.4.

Egypt In spite of the variable weather and rain of the first half of February, particularly in Lower Egypt, land preparation was not seriously impeded. Sowing, which began towards the end of January in the provinces of Minya, Girga, Qena and Aswan spread to the other provinces at the beginning of February at dates similar to those of last year. Sowing was not very active, however, owing to the unfavourable weather. The area sown in the provinces of Minufiya and Qalyubiya totalled 28 per cent against 32 per cent at the same date last year. In northern Delta sowing had only begun on a small area. The proportion of germination is generally satisfactory, although the low temperature during the second half of February checked it in some districts. Results will become apparent before long. The ploughing of land on which clover had been cut and is now to be cultivated to cotton was nearly completed at the beginning of March.

Cotton ginned up to the end of February, in bales of 478 lb. net weight was as follows

Varieties	1940	1939	1938	1937	1936	1935	1934
Giza 7	454,015	319,847	428,117	368,936	238,332	168,217	87,990
Sakellariadis	39,209	44,392	77,183	97,704	163,182	166,519	208,982
Other varieties above							
1 1/8"	83,683	80,365	94,277	84,552	88,684	47,825	97,878
1 1/4"	66,989	38,911	27,806	28,459	39,164	36,759	69,396
1 1/2"	900,414	868,708	1,099,478	1,160,323	1,030,308	930,335	1,020,467
Total	1,544,310	1,352,223	1,726,861	1,739,974	1,559,670	1,349,675	1,484,713
Scario	28,908	26,599	29,963	38,094	34,032	28,583	29,757
Total production (including Scario) *	1,815,221	1,728,090	2,281,223	1,887,164	1,768,581	1,565,583	1,776,908

* Second estimate

CURRENT INFORMATION ON HEMP.

Italy The area to be cultivated to hemp in 1940 was fixed at 282,000 acres, against a sown area in 1939 of 224,000. The average area harvested in 1934-1938 was 189,000 acres.

Romania Owing to the five-year agricultural plan which will be applied this spring, an appreciable increase is to be expected in the areas of flax and hemp grown for seed and fibre.

Argentina The crop condition of hemp in February promised a good production this season, particularly in Santa Fe.

Area and Production of Hemp.

COUNTRIES	AREA				PRODUCTION								
	1939	1938	Average 1933 to 1937	% 1939		1939	1938	Average 1933 to 1937	% 1939				
				1938	Aver- age				1938	Aver- age			
ooo acres			= 100	= 100	ooo lb			= 100	= 100				

Fibre.

Germany	1)	39	1)	32	2)	9	122.6	—	...	3)	25,953	3)	12,181	...	...
Bulgaria		23		25		16	93.4	146.3	...		9,062		7,098	159.8	204.0
France . . . . .		...		9		8	...	...	...		9,231		7,933	...	...
Italy		224		225		173	99.6	129.5	...		239,487		168,180	...	...
Poland . . . . .		...		83		82	...	...	...		28,306		24,976	...	...
Romania		143		126		119	113.5	119.9	...		66,790		57,155	128.5	150.2
Yugoslavia . . . . .		...		143		110	...	...	...		122,135		90,332	...	...
U. S. S. R.	5)	986		1,248	6)	1,467	79.0	67.2	...		...	7)	477,247	...	...
Japan . . . . .		...		17		15	...	...	...		19,847		16,890	...	...
Manchukuo . . . . .		...		89		49	...	...	...		38,422		16,094	...	...
Syria		21		12		8	174.0	273.3	...		7,637		4,962	...	...

Hempseed.

Germany	1)	39	1)	32	2)	9	122.6	—	...	3)	17,417	3)	7,781	...	...
Bulgaria		23		25		16	93.4	146.3	...		8,459		4,870	173.7	174.2
France . . . . .		...		9		8	...	...	...		...		1,636	...	...
Italy		224		225		173	99.6	129.5	...		6,221		5,601	...	...
Poland . . . . .		...		83		82	...	...	...		43,292		40,185	...	...
Romania		143		126		119	113.5	119.9	52,208		54,536		45,819	95.7	113.9
Yugoslavia		—		—		—	—	—	...		6,597		5,433	...	...
Manchukuo . . . . .		...		121	4)	151	...	...	...		80,350	4)	95,124	...	...
Syria		21		12		8	174.0	273.3	...		1,368		1,133	...	...

(1) Including Ostmark and Sudetenland — (2) Excluding the Sudetenland and Memel — (3) Excluding Ostmark — (4) Average 1935 to 1937. — (5) Area provided for in the Plan. — (6) Average 1933 to 1935 — (7) Average 1933 and 1934.

WORLD TOBACCO PRODUCTION.

Many of the important tobacco producing countries have not yet communicated to the Institute their estimates of the area and production of their 1939 tobacco crops. It is possible, however, to draw some general conclusions on the statistical position of tobacco during recent years in the principal producing-exporting countries.

Oriental tobaccos occupy a special position, not as substitutes for other kinds of tobacco but rather as blends for improving the quality of the latter owing to their taste, aroma, and burning qualities. The chief producers are Bulgaria, Greece, Turkey and to a minor extent, Yugoslavia. Identical or similar tobaccos are grown in other parts, including the south of the U. S. S. R., Italy, Albania and Romania. Since, however, the production of the latter group of countries is largely consumed internally, the name of Oriental tobaccos is

generally applied in the international market only to Bulgarian, Greek and Turkish leaf, large quantities of which are exported.

After a rather considerable contraction in the area cultivated in these countries in 1934, there was a marked recovery in 1935 and 1936. The total area of the four countries producing Oriental tobaccos grew from 374,100 acres in 1934 to 459,900 acres in 1935 and to 633,300 acres in 1936, increases of 69.3 per cent. and 37.7 per cent. respectively. In the following years there was a decline (615,800 acres in 1937 and 528,600 acres in 1938). For 1939 the figures for Turkey and Yugoslavia are still unavailable but they may be assumed to be equal to those of 1938. Consequently the total 1939 area would be about 556,000 to 558,000 acres.

Area in Countries producing Oriental Tobacco.

(thous.and acres)

COUNTRIES	1939	1938	1937	1936	1935	1934	Averages		
							1934/38	1929/33	1924/28
Bulgaria	105.5	76.9	96.1	106.3	86.0	55.4	84.1	75.1	88.2
Greece	208.3	202.1	235.5	273.5	198.4	180.9	218.1	209.1	211.8
Turkey	..	207.6	233.5	209.5	145.1	120.1	183.2	128.2	161.6
Yugoslavia		42.0	50.7	44.0	30.4	18.0	37.0	40.8	43.0
<i>Total</i>	* 556.0	528.6	615.8	633.3	459.9	374.4	522.4	453.2	504.6

* Approximate estimate

The available information on the development of the tobacco crops in these countries and the yields secured in 1939 are summarized below.

In *Bulgaria* conditions last year were rather favourable for the crop. Picking was finished early in September and the leaf was reported to be of very good quality. Production was estimated at 77,923,000 lb.; at this level it was 36.5 per cent. larger than the crop of 1938 and almost equal to that of 1937 but 16.3 per cent. below that of 1936 (93,099,000 lb.).

In *Greece* a new law was brought into force early in 1938-39 modifying an earlier measure restricting tobacco cultivation. Under this law, the Ministry of Agriculture authorized a slight expansion in the cultivation of tobacco, mainly in the districts growing the varieties and qualities for which there was an increasing demand on foreign markets. The areas were principally eastern Macedonia, Thrace, Samos and Lesbos. Despite this increase, the area cultivated in 1939 fell considerably short of that of 1936 and 1937. The weather conditions in 1939 were generally favourable. Picking was finished early in November and growers had begun curing in several districts. The outturn was appreciably larger than that of the preceding year but much below the plentiful

crops of 1937 and especially 1936. The Greek Government, in view of the great difficulties which were expected to attend marketing during the war, applied a number of restrictive measures to the 1940 crop. A special law was put into force fixing the maximum permissible area to be cultivated for the different districts. Cultivation is limited to districts which produce good qualities or which are favourably situated for prompt and easy marketing. No tobacco may be grown on lands declared unsuitable or prohibited for economic reasons except by authorization of the special commission which controls tobacco growing. In no case may tobacco be grown in districts where its cultivation was not authorized in 1939.

In *Turkey* the weather conditions of 1938-39 were fairly favourable for the tobacco crops. Unofficial estimates indicate that the crop was plentiful and very satisfactory in quality.

In *Yugoslavia* the production of 1939 was 25 per cent larger than that of 1938 and the leaf was reported to be of very good quality.

Production of Oriental Tobacco

(thous and lb.)

COUNTRIES	1939	1938	1937	1936	1935	1934	Averages		
							1934/35	1929/33	19 1/28
Bulgaria	77,923	57,096	77,995	93,099	60,685	46,685	67,112	58,643	67,817
Greece	121,158	91,655	152,812	178,507	101,550	92,109	123,327	115,503	129,835
Turkey		117,266	140,887	163,273	79,375	78,657	115,892	87,105	121,308
Yugoslavia	40,786	32,426	45,819	36,650	20,391	13,336	29,724	29,555	32,948
<i>Total</i>	<i>* 354,505</i>	<i>298,443</i>	<i>417,513</i>	<i>471,529</i>	<i>262,001</i>	<i>230,787</i>	<i>336,055</i>	<i>288,806</i>	<i>351,908</i>

* Approximate estimate

The total production of the four countries producing Oriental tobacco in 1939 was thus about 355,000,000 lb., an increase of 57,000,000 lb. on that of 1938 but a decrease of 63,000,000 lb. and of 117,000,000 lb. from the crops of 1937 and 1936 respectively.

The situation in Hungary and Italy, the only other producing-exporting countries of Europe, was as follows:

In *Hungary* the cold of the spring of 1939 was unfavourable for the nurseries and transplanting was delayed. After transplanting, cold and wet weather, followed by a long drought, hindered growth. Heavy rain came in mid-August stimulating development and the leaf matured in the dry and warm autumn and dried well. The production obtained was larger than the crops of a long series of years, except that of 1936 of which it was not far short. Quality was considered to be below normal.

Area of Tobacco in European Countries, other than those producing Oriental tobacco.
(thousand acres)

COUNTRIES	1939	1938	1937	1936	1935	1934	Averages		
							1934/38	1929/33	1924/28
Hungary	39.5	34.8	36.8	36.6	37.8	40.5	37.3	56.1	48.2
Italy	...	81.5	79.3	79.8	82.3	87.0	82.0	98.3	93.4
Other countries	..	190.3	198.4	186.3	180.4	154.7	182.0	121.2	214.7
<i>Total</i>	* 308.9	306.6	314.5	302.7	300.5	282.2	301.3	275.6	356.3

* Approximate estimate

In *Italy* growth was regular in the seed-beds in the first half of March 1939. During April conditions were favourable for transplanting but adverse weather hindered this operation in May. Growth picked up well in the first half of June but transplanting was finished in unfavourable weather and soil conditions. Picking was under way at the end of July in some provinces with variable results. Production was estimated to be good to average and in some areas there was local damage caused by bad weather. At the end of September, according to unofficial sources, tobacco production was considered satisfactory.

Production of Tobacco in European Countries, other than those producing Oriental tobacco.
(thousand lb.)

COUNTRIES	1939	1938	1937	1936	1935	1934	Averages		
							1934/38	1929/33	1924/28
Hungary	48,852	43,061	45,008	50,327	47,269	40,040	45,141	72,248	52,016
Italy	.	92,758	94,632	92,969	101,988	100,009	96,471	107,465	90,734
Other countries	.	236,367	254,383	273,793	195,024	261,183	244,150	233,883	237,212
<i>Total</i>	* 330,695	372,186	394,023	417,089	344,281	401,232	385,762	413,596	379,962

* Approximate estimate

Among the countries not mentioned individually in the above tables, *Belgium* experienced favourable weather in 1939. A small percentage of the crop was affected by *Bacterium tabacum*. The cultivated area in 1939 was 5,700 acres and production 11,614,000 lb. against 5,300 acres and 10,538,000 lb. in 1938. Quality was a little below average owing to wet weather at curing time but the colour of the dried leaves was better than that of the preceding year.

Among the other countries of the Northern Hemisphere, the 1939 crop in the *United States* was exceptionally abundant and reached a record figure. There was a large increase in particular in flue-cured tobacco the production of which was 1,022,953,000 lb. against 785,730,000 lb. in 1938, an increase of 30 per cent. The large outturn was partly due to the expansion in the area, which was 21.3 per cent. larger than that of 1938, and partly to the increase of the yield was 927 lb. per acre, compared with a ten-year (1928-1937) average of 760 lb.

According to the report of farmers' intentions to plant on March 1, 1940, the area to be sown tobacco is estimated 1,524,000 acres.

*Area of Tobacco in the Principal Extra-European Countries
of the Northern Hemisphere.*

(thousand acres)

COUNTRIES	1939	1938	1937	1936	1935	1934	Averages		
							1934/38	1929/33	1924/28
United States	1,942.3	1,600.5	1,735.2	1,438.4	1,437.2	1,278.5	1,498.0	1,846.9	1,700.4
Cuba	100.6	112.2	122.1	108.5	115.2	102.8	112.2	(1) 125.8	(-) 150.2
Puerto Rico		63.0	49.9	43.7	38.1	45.5	48.0	33.6	49.4
India		1,235.5	1,182.9	1,253.1	1,307.9	1,124.1	1,220.7	1,179.0	1,256.1
Japan	106.3	91.7	85.5	86.7	86.0	84.5	86.9	87.0	91.9
Philippines		185.3	182.9	161.9	152.0	136.9	163.8	192.7	194.5
Algeria		56.8	59.3	55.1	56.8	56.8	57.0	53.9	65.7
Total	* 3,706.6	3,345.0	3,417.8	3,147.4	3,193.2	2,829.1	3,156.6	3,189.9	3,508.2

* Approximate estimate — (1) Average of three years — (—) Year 1928

The cultivated area in *Cuba* in 1939 was 10.7 per cent. smaller than that of 1938. This contraction was the result of a large accumulation of stocks in the two previous years and, in particular, of the uncertainty on European markets. Production showed a still more marked reduction owing to the excessive rain at the period of germination the resultant rotting affecting all the seed-beds of early varieties. The outturn fell from 55,336,000 lb. in 1938 (the highest of the last ten years) to 45,195,000 lb. in 1939, a decrease of 18.4 per cent.

In *Puerto Rico* the conditions of the 1938-39 season were favourable for the tobacco crop. The area in 1939 was officially estimated at approximately the same as in the previous year and the quality of the crop was reported to be better than usual.

The official estimate of the area and production in *India* in 1939 has not yet been issued but, according to reliable information, a crop similar to that of last year from a slightly larger area was to be expected.

In *Algeria* conditions in February 1939 were favourable for growth in the nurseries and for the preparation of land for transplantings. Later, owing to the stormy and uneven weather of the second half of May, work was delayed. Transplanting progressed well early in June. The transplantings grew well and work was hastened in order to make up for the delay caused by the changeable weather. Crop condition at July 1 promised an average crop.

*Production of Tobacco in the Principal Extra-European Countries
of the Northern Hemisphere.*

(thousand lb.)

COUNTRIES	1939	1938	1937	1936	1935	1934	Averages		
							1934/38	1929/33	1924/28
United States	1,769,634	1,376,467	1,552,597	1,155,325	1,297,154	1,081,627	1,292,634	1,426,711	1,298,944
Cuba	45,140	55,321	55,398	42,139	42,514	46,264	48,327	62,574	60,257
Puerto Rico		44,062	34,983	25,999	22,500	25,001	30,509	24,116	31,004
India		1,124,485	1,113,283	1,355,204	1,431,365	1,155,843	1,236,036	1,258,883	1,135,148
Japan	180,802	144,602	140,957	133,358	144,467	145,453	141,767	143,484	142,657
Philippines		74,957	73,544	71,057	63,145	72,041	70,949	98,739	101,924
Algeria		42,007	38,854	40,883	41,648	49,000	42,478	39,507	53,037
<i>Total</i>	<i>*3,273,876</i>	<i>2,861,901</i>	<i>3,009,616</i>	<i>2,823,965</i>	<i>3,042,793</i>	<i>2,575,229</i>	<i>2,862,700</i>	<i>3,054,014</i>	<i>3,039,261</i>

* Approximate estimate — (1) Year 1928

In *Japan* conditions in 1939 were very favourable. The area cultivated was 106,000 acres, an increase of 16.2 per cent. on that of the preceding year (91,700 acres). Production was 25 per cent. larger (181,000,000 lb. against 144,602,000 lb.).

The Government of *Indochina* reports that weather conditions were unfavourable for tobacco in Annam in the areas supplying the local industry owing to excessive rain at the time of sowing and replanting and to drought at the end of the growing cycle. Parasites and disease, however, did little damage. The competition of more profitable crops (maize, groundnuts) and unfavourable weather caused a contraction in the tobacco crop. The quality of the crop was below average and leaves were short and thick owing to the drought.

Information on the other producing countries of the Northern Hemisphere is incomplete but it is possible to put the total production at 3,770,000,000 lb., the largest figure for many years.

The only official estimate of the crops of the Southern Hemisphere is that for Nyasaland. Some information on the other countries is given below.

The crop of the *Netherlands Indies* (Java) is reported to be rather poor. A considerable part of the plantations suffered from heavy rain and there was extensive loss.

*Area of Tobacco in the Principal Countries
in the Southern Hemisphere.*

(thousand acres)

COUNTRIES	1939-40	1938-39	1937-38	1936-37	1935-36	1934-35	Averages		
							1934-35/ 1938-39	1929-30/ 1933-34	1924-25/ 1928-29
Brazil	266.9	268.4	253.5	307.2	245.6	268.3	227.1	257.7
Netherlands Indies	469.5	475.9	419.3	457.6	506.8	465.8	483.3	521.4
Madagascar	17.3	17.3	17.5	22.2	27.4	20.3	27.9	13.3
Nyasaland	59.3	59.1	43.2	38.5	41.5	48.3	43.0	35.1
Southern Rhodesia	62.3	66.0	40.8	41.5	41.0	50.3	25.9	23.5
<i>Total *</i>	<i>864.9</i>	<i>875.3</i>	<i>886.7</i>	<i>774.3</i>	<i>867.0</i>	<i>862.3</i>	<i>853.0</i>	<i>807.2</i>	<i>851.0</i>

* Approximate estimate.

In *Madagascar*, the tobacco crop, which was first grown in 1929, has declined appreciably in the last three years. The decline has many causes including, in particular, the fall of the franc which has resulted in a notable increase in the prices of agricultural products. Cultivation in the Mangoky valley has been prohibited since 1937 owing to the poor quality of the crop. Other measures calculated to effect an improvement in the quality of production have been applied, including the prohibition of the crop in some areas and the award of bonuses for quality applicable to light and coarse tobaccos. There has also been an increase in the basic prices.

In *Nyasaland* damage was caused by bad weather in the south. Yields were better in the north. Quality was considered to be below average.

Production of Tobacco in the Principal Countries of the Southern Hemisphere.

(thousand lb.)

COUNTRIES	1939-40	1938-39	1937-38	1936-37	1935-36	1934-35	Averages		
							1934-35/ 1938-39	1929-30/ 1933-34	1924-25/ 1928-29
Brazil . . . . .	...	176,370	174,924	191,794	200,324	224,464	193,575	214,603	166,544
Netherlands Indies . . . . .	...	119,050	119,050	119,050	114,641	114,641	117,286	179,259	179,236
Madagascar . . . . .	...	13,889	13,889	14,110	14,771	15,977	14,527 ¹⁾	18,905	14,921
Nyasaland	12,699	17,928	17,458	16,484	12,403	15,216	15,898	14,791	12,057
Southern Rhodesia . . . . .	...	26,456	26,872	22,049	22,181	21,206	23,753	14,096	11,861
<i>Total *</i>	<i>330,694</i>	<i>353,693</i>	<i>352,193</i>	<i>363,487</i>	<i>364,320</i>	<i>391,504</i>	<i>365,039</i>	<i>432,654</i>	<i>384,619</i>

* Approximate estimate. — ⁽¹⁾ Average of four years.

In *Southern Rhodesia*, according to an official report, picking and curing were finished in May and processing of Turkish tobacco was making satisfactory progress.

Argentina recently published the first official estimate of the area planted to tobacco in 1939/40, namely 49,650 acres, which is 3,200 acres larger than the 1938/39 area (46,400 acres) and 21,000 acres above the figure for 1937/38 (28,600 acres). Weather conditions this year were generally favourable for tobacco cultivation.

The total production of the Southern Hemisphere may be estimated at about 330 million lb. which, with the Northern Hemisphere's total of 3,770 million lb., brings the total production of all the principal producing countries to 4,100 million lb.

Since the countries considered produce about 80 per cent. of the world total (excluding the U. S. S. R. and China) total world production may be put roughly at 5,070 million lb. This is a conjectural estimate subject to modification—probably a slight reduction. In any case, the world crop of 1939 in the largest of the last fifteen years. Comparative figures of world tobacco production are as follows, in million lb.: 1938, 4,564; 1937, 4,749; 1936, 4,579; 1935, 4,603; 1934, 4,123; average 1934-1938, 4,523; average 1929-1933, 4,991; and average 1924-1928, 4,453.

E. ARNOLD PERDUE

CURRENT INFORMATION ON HOPS.

Area and Production of Hops.

COUNTRIES	AREA					PRODUCTION				
	1939	1938	Average 1933 to 1937	% 1939		1939	1938	Average 1933 to 1937	% 1939	
				1938	Aver- age				1938	Aver- age
000 acres			= 100	= 100	000 lb			= 100	= 100	
Germany	(1) 35.5	(1) 36.5	(2) 24.2	97.2	—	...	(2) 21,867	(2) 18,297	...	...
Belgium	2.0	1.8	2.1	111.0	97.4	...	2,105	2,555	...	...
France . . . .	...	4.1	4.6	...	...	...	4,687	4,635	...	...
Hungary . . . .	...	0.2	0.2	...	...	...	123	147	...	...
Poland . . . .	...	8.2	7.5	...	...	...	5,037	3,408	...	...
Romania	0.1	0.1	0.1	183.3	59.5	35	21	41	168.1	84.5
United Kingdom .	...	...	...	...	...	...	...	...	...	...
Engl and Wales.	18.9	18.5	17.9	102.4	105.5	...	28,784	27,104	...	...
Yugoslavia . . .	...	7.6	6.4	...	...	...	3,527	3,917	...	...
—
Canada . . . .	...	1.1	1.1	...	...	...	1,769	1,552	...	...
United States . .	31.0	31.5	34.2	98.4	90.5	39,380	35,261	40,146	111.7	98.1

(1) Including Ostmark and Sudetenland — (2) Not including Sudetenland. — (3) Not including Ostmark.

CURRENT INFORMATION ON OTHER PRODUCTS:

Cacao.

Netherlands Indies: The production of cacao in 1939 is estimated at 37,100 cents against 35,000 in 1938 and an average of 35,200 in 1932 to 1936; percentages, 106.4 and 105.6.

Gold Coast and British Togoland MAIN CROP 1939-40. — During the first half of January the weather conditions generally have been unfavourable for growth but favourable for drying. Marketing continued freely during January. In some districts it is reported that firms have had difficulty in filling their January quotas—an indication that the crop will finish shortly. Few or no pods or flowers are reported on the trees. As the crop is finishing farmers are fermenting small lots and these contain beans from over-ripe pods. In consequence the percentage of slate and germinated beans is rising. Fears of further deterioration from inadequate storage accommodation are expressed in reports from some districts. Taking the average of district report figures, it is estimated that 99 per cent. of the crop is now ripe, 96 per cent. has been harvested, 81 per cent. has been marketed and 15 per cent. remain in farmers' hands. From figures submitted in connection with Cacao Control the amount marketed to date is, in round figures, 443.5 million lb. Figures otherwise compiled would give a total of 448.0 million lb. marketed; the difference is probably accounted for by incomplete Cacao Control returns of shipments. Taking 443.5 million lb. as the amount marketed, this would equal 79.2 per cent. of a 560.0 million lb. crop. It will be noted above that district reports give a figure of 81 per cent. as the amount marketed. Either the estimate of the total crop or the estimate of the amount marketed is too high. If 443.5 million lb. is 81 per cent. of the crop, this would give slightly under 548.8 million lb. as the total main crop. It is therefore fairly certain that the estimate of 560.0 million lb. will not be exceeded, and it may have to be revised downwards eventually by, say, 11.2 thousand lb., which is 2 per cent. of 560.0 million lb., a reasonably small error.

The situation during the January 1940 is summarized below.

	January 1940	January 1939
	(million lb.)	
Stocks at end of month		
in the interior	159.0	118.7
at ports	138.9	161.3
<i>Total</i>	<i>297.9</i>	<i>280.0</i>
Entered at ports	114.2	—
Total exports (incl. overland)	67.2	—

In view of conflicting reports as to quality a comparison of the percentage falling in the various grade classes in January in the two seasons 1939-40 and 1938-39 is given below:

	Original sampling		Check sampling at ports	
	1939/40	1938/39	1939/40	1938/39
I.	38.0	39.0	31.0	60.0
II.	60.0	56.0	59.0	36.0
III.	2.0	5.0	10.0	4.0
Sub-grade	0.0	0.0	0.0	0.0
	100.0	100.0	100.0	100.0

MOVEMENT — Movement statistics for January are as follows.

	January 1940 (million lb.)
Railway off loadings, Takoradi	33
<i>Exports</i>	
Takoradi	28
Accra	28
Other ports	15
<i>Total</i> . . .	71
Eastern Frontier	1
<i>Total exports</i> . . .	72

Tea.

India In North India the weather in December was seasonable, being cold and dry, without rain. Practically the entire crop was harvested. The preliminary final figures to the end of December recorded an increase of 13,340,000 lb. on the outturn to the same date in 1938.

In South India bright cold weather with frost prevailed. Crop prospects were considered only moderate. Outturn was 35 % ahead of that to the same date in 1938.

In North India weather in January was seasonably cold and dry. No leaf was plucked.

In South India dry and very cold weather continued and prospects were considered only moderate, outturn was 93 per cent behind that to the same date last year.

Netherlands Indies The production of tea in 1939 is estimated at 184,744,000 lb. against 179,300,000 lb. in 1938 and an average of 162,303,000 lb. in 1933 to 1937 percentages, 103.0 and 113.8.

Coffee.

Brazil The quantity of coffee destroyed in Brazil from 1931 until January 31, 1940 totals 90,551,000 centals, of which 267,000 were eliminated in January. According to the "Departamento Nacional do Café", available stocks in Brazilian ports on January 31, 1940 totalled 4,495,000 centals, of which 2,890,000 were in the port of Santos, 890,000 in the port of Rio de Janeiro and the remaining 706,000 in the other ports.

Ecuador The total area of coffee plantations in 1939-40 is officially estimated at 100,000 acres of which 85,000 are in bearing. Coffee production this season is estimated at 375,000 centals, of which 287,000 represents the exportable surplus of the season.

Netherlands Guiana The condition of coffee crops in December was good and promised a fairly large crop.

Dominican Republic January weather conditions were favourable for coffee picking. Unit yields are high and the product is of good quality.

Salvador Rain in December hampered coffee drying, causing fermentation when sunny weather was needed. Picking results are uneven and vary from one district to another, but yields on the whole are satisfactory.

Venezuela: Weather conditions in January were favourable for coffee picking. Forecasts of an abundant crop are confirmed.

Philippines: Coffee production this season is slightly larger than the 1938-39 figure, which was normal.

Netherlands Indies: The production on European plantations of coffee in 1939 is estimated at 1,259,000 centals against 1,005,000 in 1938 and an average of 1,275,000 in 1933 to 1937; percentages, 125.3 and 98.7.

Angola: The December report confirms an average coffee crop of good quality this season.

Nyasaland: Coffee production this season is estimated as average.

Sierra Leone: The condition of coffee shrubs in January was normal.

Hawaii: Weather conditions in December were not favourable for coffee picking. The condition of plantations in January was consequently rather poor.

New Caledonia: In November and December there was a severe drought. The condition of coffee shrubs in December was excellent in most parts of the east coast, where the soil has adequate moisture, whereas, on the west coast, plantations were in a serious condition. Flowering failed in some parts.

New Hebrides: Coffee plantations suffered some damage from unfavourable weather conditions in December.

Groundnuts.

Argentina: The condition of groundnuts in February was good, crops having benefited from rains in the principal producing centres.

Uruguay. According to the most recent information, the area cultivated on groundnuts in 1939-40 is estimated at 12,500 acres, against 6,400 acres in 1938-39 and an average of 4,100 acres in the five years preceding, percentages 166.6 and 303.7.

Burma: There was a slight decrease in the areas sown and matured as compared with last season. The rains were insufficient at the time of sowing and at that of pod formation. According to the third estimate area harvested for groundnuts this year was about 749,000 acres against 814,700 in 1938-39 and 810,000 on the average of the two years ending 1937-38, percentages 91.9 and 92.4. The corresponding production is estimated at about 4,256,000 centals (212,800 short tons) against 4,032,000 (201,600) and 3,658,000 (182,900) for the five-years average, percentages 105.6 and 116.4.

Netherlands Indies: Java and Madura. The production of groundnuts in 1939-40 is estimated at 4,176,000 centals against 4,449,000 in 1938-39 and an average of 4,674,000 in 1933-34 to 1937-38; percentages, 93.9 and 89.3.

Egypt: According to the last estimate area cultivated to groundnuts in 1939 was about 24,700 acres against 23,800 in 1938 and 22,500 on the average of the five years ending 1937; percentages 103.6 and 109.7. The corresponding production is estimated at about 365,000 centals against 345,000 and 313,000; percentages 105.9 and 116.8.

Colza and Sesame.

Greece: According to the most recent estimate area cultivated to sesame in 1939 was about 118,100 acres against 92,400 in 1938 and 93,500 on the average of the five years ending 1937; percentages 127.8 and 126.2. The corresponding production is estimated at about 419,700 centals (21,000 short tons) against 127,800 (6,400) and 197,500 (9,900), percentages 328.5 and 212.5.

Hungary: Winter colza was considerably damaged by the severe winter.

Romania: According to the most recent estimate production of colza in 1939 was 789,000 centals (1,577,000 bushels of 50 lb.) against 1,169,000 (2,337,000) in 1938 and 810,000 (1,620,000) on the average of the five years ending 1937; percentages 67.5 and 97.3.

Burma: The late rains were deficient. According to the final estimate, the area harvested for sesame this year was about 1,080,200 acres against 1,084,208 in 1938-39 and 1,031,000 on the average of the two years ending 1937-38 percentages 99.6 and 104.8. The corresponding production is estimated at about 1,165,000 centals (58,200 short tons) against 1,187,000 (59,360) and the five-year average of 1,172,000 (58,580), percentages 98.1 and 99.4.

India: Condition and prospects of the rape and mustard crops were reported in January to be fairly good on the whole. In Bengal, which follows the United Provinces as a producer, rain was light to moderate in February and benefited the crops, leaving prospects fair at the end of that month. In Bihar rainfall was light to moderate in mid-February; crops were going on well, though there had been slight hail damage in Patna and Gaya.

Condition of the sesame crop was reported in the latter part of January to be fairly good on the whole. In Madras, the leading producing province, light rain fell in February. Crops were in fair condition.

Palestine: According to the most recent estimate area cultivated to sesame in 1939 was about 19,200 acres against 20,400 in 1938 and 15,000 on the average of the five years ending 1937; percentages 94.1 and 128.2. The corresponding production is estimated at about 82,800 centals (4,100 short tons) against 142,000 (7,100) and 92,100 (4,600), percentages 58.3 and 89.6.

Egypt: According to the last estimate area cultivated to sesame in 1939 was about 18,500 acres against 20,200 in 1938 and 19,700 on the average of the five years ending 1937, percentages 91.5 and 94.0. The corresponding production is estimated at about 124,000 centals (6,200 short tons) against 134,000 (6,700) and 129,000 (6,500); percentages 92.7 and 96.1.

Sunflowers.

Argentina: The acreage under sunflowers in 1939-40 is the largest recorded in the country, owing to the fact that the cereal areas abandoned as a result of the unfavourable season, have been given over to this crop. The acreage considerably exceeds the record figure of last season (722,000 acres). Crop condition in February varied from good to excellent. The harvesting of early varieties was making good progress in Santiago del Estero and Corrientes, the yields obtained being very high.

Uruguay: The area under sunflowers has increased considerably during the last five years, rising steadily from 5,600 acres in 1935-36 to 94,500 in 1939-40. The most marked increase, however, has occurred this season, the area being about four times as large as that of 1938-39 (19,300 acres).

CURRENT INFORMATION ON FODDER CROPS.

Ireland. The weather in February was very unsettled, with rain every other day. Supplies of hay were rather scarce, but, if used economically, were expected to last through the winter. Root supplies were normal.

Romania. In the following table are given the latest estimates of production of the principal fodder crops.

	1939	1938	Average 1933-37	1939	1938	Average 1933-37	% 1938 = 100	% 1939 = 100
	(ooo centals)			(ooo short tons)				
Clover . . . (hay)	13,920	14,739	10,630	696	737	531	94.4	131.0
Alfalfa . . . ()	11,627	11,627	6,203	581	581	460	100.0	106.3
Fodder millet . . ()	7,804	6,217	7,763	390	311	388	125.5	100.5
Other rotation mea- dows . . . ()	6,693	8,802	9,379	335	440	469	76.0	71.4
Permanent mea- dows . . . ()	56,226	71,235	57,222	2,811	3,562	2,861	78.9	98.3
Fodder roots	11,512	13,270	10,540	577	664	527	87.0	105.5

Uruguay. The preparation of the land for the sowing of fodder cereals was retarded at the beginning of March, owing to the hardness of the ground following the drought of February.

Egypt. The growth of clover in Lower Egypt is slightly below average. The third cutting of early crops is in progress. Flowering is general in irrigated areas left for the production of seeds in Upper Egypt, and their crop condition is satisfactory.

LIVESTOCK AND DERIVATIVES

LIVESTOCK IN GERMANY.

Numbers of Livestock.

(ooo,ooo)

CLASSIFICATION	December 1, 1939		Dec 3 1938
	Greater Germany	Former territory	
Cattle, total	23.9	19.9	19.9
milk cows	11.9	10.0	10.0
Pigs	29.1	25.2	23.6
Sheep	5.2	4.9	4.8
Goats	3.0	2.3	2.5
Poultry, total	111.7	97.4	97.9
fowls	103.3	89.5	88.6
Beehives	3.6	2.8	2.6

The data on livestock in Greater Germany on December 4, 1939 are not comparable with those of previous years. We therefore compare the latest figures with those of 1938 for the former territory of the Reich only.

The returns show that despite the war the growth of livestock numbers is normal. There is even an appreciable increase in pigs, an important source of fats.

PIG POPULATION IN DENMARK. *

(Thousands)

CLASSIFICATION	1940	1939									1938	
	Febr. 10	Dec. 30	Nov. 18	Oct. 7	Aug. 26	July 15	June 17	May 6	March 25	Feb. 11	Dec. 31	Nov. 19
Boars for breeding	17	17	17	18	18	18	17	18	18	18	17	16
Sows in farrow for first time	89	80	63	62	65	76	82	111	119	109	82	67
Othersows in farrow	169	162	176	189	192	171	163	160	152	145	143	147
Sows in milk	80	95	86	81	85	99	101	81	78	77	72	68
Sows not yet covered (and not for slaughter)	25	21	24	25	27	27	23	20	19	19	23	24
Sows for slaughter	12	12	15	15	9	10	9	9	9	9	9	13
<i>Total sows</i>	<i>375</i>	<i>370</i>	<i>364</i>	<i>372</i>	<i>378</i>	<i>383</i>	<i>378</i>	<i>381</i>	<i>377</i>	<i>359</i>	<i>329</i>	<i>319</i>
Sucking pigs not weaned	662	804	735	696	731	841	862	684	652	648	603	581
Young and adult pigs for slaughter.												
Weaned pigs under 35 kg	769	749	732	767	839	771	660	657	636	618	639	676
Pigs of 35 and under 60 kg.	659	657	697	766	663	641	589	571	550	571	615	608
Fat pigs of 60 kg and over	558	537	685	573	535	473	491	443	491	505	503	561
<i>Total pigs</i>	<i>3,040</i>	<i>3,134</i>	<i>3,230</i>	<i>3,192</i>	<i>3,164</i>	<i>3,127</i>	<i>2,997</i>	<i>2,754</i>	<i>2,724</i>	<i>2,719</i>	<i>2,706</i>	<i>2,761</i>

* Rural districts

SHEEP AND WOOL IN ESTONIA.

CLASSIFICATION	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930
Sheep (thousand)	696	650	650	584	593	522	541	514	479	497
Production of wool (thousand pounds)	2,599	2,452	2,466	2,258	2,031	2,088	2,235	1,732	1,508	1,476

LIVESTOCK, POULTRY AND BEEHIVES IN LUXEMBURG.

CLASSIFICATION	October 15 1939	December 1 1937	December 1 1934	December 1 1931
<i>Horses</i>	18 017	17 307	17 036	16 987
Foals under 1 year	865	668	610	512
Horses over 1 year	17 152	16 639	16 420	16 475
<i>Asses</i>	16	17	26	20
<i>Mules</i>	22	42	89	137
<i>Cattle</i>	107 417	108 512	102 720	99 201
Calves under 1 year	27 138	28 267	26 127	26 407
Young stock from 1 to 2 years	16 986	16 705	17 491	17 299
Cattle 2 years old and over of which milk cows	63 393 (56 613)	63 540 (57 026)	59 102 (55 080)	55 495 (50 986)
<i>Sheep</i>	8 465	6 955	7 246	7 738
<i>Goats</i>	3 107	3 515	4 391	5 117
<i>Pigs</i>	154 727	147 366	163 337	149 605
Sucking pigs under 6 months	104 677	99 285	107 906	101 251
Pigs for fattening 6 months old and over	35 365	35 665	39 858	34 015
Pigs for reproduction				
Bitches	522	457	555	526
Sows in farrow	6 716	5 875	7 187	13 813
Other sows	7 447	6 084	7 831	
<i>Poultry</i>				
Cocks, hens and chickens	520 194	518 483	510 852	517 341
Geese	5 101	6 237	7 783	7 222
Ducks	4 298	5 103	5 191	5 639
Turkeys	1 541	2 052	2 155	1 405
Guinea fowls	530	536	509	—
Pigeons	17 412	22 420	20 86	—
<i>Beehives</i>	14 422	12 236	12 449	10 822

SLAUGHTERINGS OF FAT STOCK IN SWITZERLAND.

The statistics of slaughterings of fat stock which are published regularly by the Federal Bureau of Industry, Arts and Crafts and Labour covering 42 towns of Switzerland show the following results: the total number of animals slaughtered in 1939 was approximately the same as in 1938. While the number of all categories increased by 4,039 or 0.6 per cent thus reaching 692 967 the total weight of 159,610,000 lb shows a slightly smaller proportionate increase on 1938 of 665,000 lb or 0.4 per cent.

Years	Number of Slaughterings		Net weight of Slaughterings	
	Carcasses	Index No. 1937/31 = 100	Pounds lb	Index No. 1927/31 = 100
1939	692 967	103	159 610	106
1938	697 006	104	158 945	105
1937	682 714	102	151 751	101
1936	680 500	101	154 867	103
1935	748 142	111	170 215	113
1934	730 296	109	169 078	112
1933	719 382	107	165 866	110
1932	716 837	107	155 520	103
<i>Average 1927 to 1931</i>	<i>672 435</i>	<i>100</i>	<i>150 872</i>	<i>100</i>

The totals for 1939 are 3 per cent. larger in number and 5.8 per cent. larger in net weight than the averages of 1927 to 1931.

Considered quarterly, in comparison with the previous year, the trend of slaughtering was, on the contrary, declining. In the first and second quarter considerable slaughtering was made necessary by foot-and-mouth disease. The net weight in the first quarter shows an increase of 7.7 per cent. and in the second quarter of 4.2 per cent. on the previous year. In the third quarter there was a rise of only 0.9 per cent. While July showed a rise of 9.3 per cent. and August of 2.0 per cent. September showed a fall of 7.6 per cent. on the previous year. This heavy drop was principally due to mobilization, the absence of those under arms having reduced the requirements of the civil population, while slaughtering for the army were only to a small degree included in the statistics. For the same reason the fourth quarter also shows a considerable drop (8.8 per cent.).

The following table gives a comparison of the different categories of livestock in 1938 and 1939

CATEGORIES OF ANIMALS	Number of slaughtering				Net weight in thousand lb			
	January December		Difference		January December		Difference	
	1939	1938	absolute	%	1939	1938	absolute	%
Bulls . . .	13,602	13,583	+	19	11,245.2	10,960.1	+	285.1
Oxen	4,425	6,869	—	2,444	3,365.6	5,345.8	—	1,980.2
Cows	47,813	47,210	+	603	29,514.7	29,142.6	+	372.1
Heifers	28,043	28,708	—	665	16,816.3	16,835.2	—	18.9
Calves	201,678	205,218	—	3,530	25,343.5	25,334.7	+	8.8
Sheep	50,753	38,288	+	12,465	2,237.9	1,772.5	+	465.4
Goat . . .	1,084	766	+	318	35.9	27.1	+	8.8
Pigs	343,390	353,587	—	10,197	69,648.5	67,819.0	+	1,829.5
Horses	2,179	2,787	—	608	1,402.8	1,708.1	—	305.3
TOTAL	692,967	697,006	—	4,039	159,610.4	158,945.1	+	665.3

The slaughtering of oxen show the largest decrease; namely 35.6 per cent. in the number of carcasses and 37.0 per cent. in net weight. The slaughtering of heifers were about the same as in 1938. Those of sheep, on the other hand, increased by 12,465, or 32.6 per cent., and in weight by 26.3 per cent. In the case of pigs there was a decrease of 10,197, or 2.9 per cent., but an increase of 1,829,500 lb. or 2.7 per cent. in weight.

The relative differences for each category are due, as is shown in the following table, to the differences between the two years in the net weight per carcass.

	Net weight			Net weight	
	1939	1938		1939	1938
	lb			lb	
Bulls . . .	827	807	Calves	126	123
Oxen	761	778	Sheep	44	46
Cows	617	617	Pigs	203	192
Heifers	600	586	Horses	644	613

LIVESTOCK IN THE UNITED STATES.

Estimates of the numbers of livestock on farms in the United States on January 1, 1940, as compiled by the Crop Reporting Board of the Department of Agriculture, are reproduced below together with the figures for the preceding two years and the averages of the ten years 1929 to 1938.

Number of Livestock on Farms on January 1.

	1940	1939	1938	Average 1928-39
		(Thousand head)		
Horses	10,616	10,815	11,128	12,425
Mules	4,321	4,384	4,428	4,981
Cattle, total	68,769	66,789	66,083	66,250
Cows and heifers 2 years old and over kept for milk	(25,334)	(25,088)	(24,834)	(24,839)
Sheep	54,473	53,783	52,682	52,338
Pigs	58,312	49,293	44,218	51,846
Chickens, 3 months old and over	429,022	412,604	386,573	428,054
Turkeys	8,567	6,418	6,146	5,825

The estimated number of horses, including colts, on farms on January 1, 1940 was 10,616,000, a decrease of 2 per cent. on the previous year. The number of colts under 1 year of age was smaller than a year earlier, indicating a further decline during 1939 in the number of colts foaled.

The number of mules, including colts, was about 1½ per cent. smaller but there was an increase in the number of colts under 1 year.

Owing to the larger supplies of feed and the more favourable feed situation in 1939, cattle numbers increased to 68,769,000, a rise of 3 per cent. during the year. About one-fourth of the increase was in milk cows and heifers, and three-fourths in cattle left principally for beef. Three-fourths of the increase was in the region including the States bordering the Mississippi River and eastward. Rather sharp reductions in numbers in Texas and several of the Western States tended to offset general increases in other States in the Great Plains and Western regions.

The number of milk cows (cows and heifers two years old and over kept for milk) was 25,334,000 head, an increase of about 1 per cent. The number of yearling heifers kept for milk cows was estimated at 5,433,000, an increase of 6 per cent., and the number of heifer calves being kept for milk cows, at 5,654,000, was a little smaller than a year earlier.

Pig numbers, owing again to the favourable feed situation in 1939, showed an increase of 9,029,000 to 58,312,000, or 18 per cent. This is the second largest increase on record.

Sheep numbers increased from 53,783,000 to 54,473,000 or by about 1 per cent.

The number of chickens, at 429,022,000, was 4 per cent. larger than a year earlier and slightly above the ten-year average. Turkey numbers at 8,567,000, were the highest on record.

The latest information indicates that the total pig crop in the United States in 1939 was 84.3 million head, the largest crop in the 16 years of record, and it is expected that the pig slaughtering in the 1939-40 marketing year will exceed 47 million head. Consumer incomes are expected to be higher in 1940 and the export prospects for pork and lard are also better. The effects of improved demand, however, are expected to offset only partly the increase in supplies of pigs.

The number of sows to farrow in the spring of 1940 was indicated to be the same as the number farrowing in the spring of 1939, according to reports on breeding intentions made about December 1. Since that date, however, the hog-corn ratio has turned unfavourable for pig producers and consequently fewer sows will be kept for spring farrowing than was indicated on December 1. It now seems probable that both spring and fall crops in 1940 will be smaller than the crops of 1939.

* * *

The number of cattle on feed for market on January 1 was larger this year than last in both the Corn Belt States and the Western States. This increase will be reflected in materially larger marketings of grain-fed cattle in 1940, with the increase more pronounced in the first half of the year.

The number of sheep and lambs on feed on January 1 was also larger than a year earlier and the second largest on record. It is expected that slaughter supplies of sheep and lambs during the remainder of the marketing season will be about as large as a year earlier.

Although ranges and pastures were very dry in California, the weather in December was favourable for early lambing. Early lambing in southern Arizona was completed under very favourable conditions while reports from Texas indicated that the early lamb crop would be larger than it was a year earlier.

WORLD CASEIN PRODUCTION AND TRADE IN 1940.

In view of the difficulty of obtaining recent statistics, for a survey of the production and market situation of casein, it is necessary at first to refer back to the year 1938, for the production of which year practically no precise information could be given in the article published a year ago. This is also necessary in order to obtain a proper basis for the study of the situation in 1939.

Casein supplies in 1938 was very large, both in absolute quantity and in proportion to requirements. The causes of this were numerous. The principal reason seems to be that a considerable rise had taken place in 1937 in the level of casein production in the United States, amounting to 50 per cent. on the previous year, as a result of the subsidies for butter production. In 1938, production was not so large but was still very considerable.

Further reasons for the rise in world casein production were the further increase in German production and the efforts made by Japan to replace part

of her imports, which had recently risen considerably, with the home production of casein not from milk, but from the soya-bean. Argentina, owing to reduced demand, was only able to dispose of four-fifths of her production of 1937; thus in 1938 there were reductions of production not only in Argentina but also in several other exporting countries, particularly New Zealand. In spite of this fact, in 1938 also such large quantities in Argentina remained unsold that the surplus of production over export during these two years totals nearly half its production of 1938. While in France, which is the other large exporting country, the situation was much less critical, the general market situation at the beginning of 1939 was very depressed. This slump was gradually accentuated during the spring, because Argentina was making every effort, and with success, to dispose of her stocks. Consequently, the price of casein, particularly Argentine casein, fell to an exceptionally low level. The market remained dull until the end of June. At the beginning of July the price of Argentine lactic acid casein on the London market rose sharply, while fairly large stocks were still in hand in Argentina. French lactic acid casein followed the rising trend slowly and reached in August the same level as that of Argentine casein. On the other hand, the price of rennet casein, which is not used in the armament industry, simultaneously declined and fell temporarily below that of lactic acid casein.

Thus, prices were very unsettled until the outbreak of war, owing to which the demand for casein for paints and glues for the armaments industry then rose considerably.

Moreover, it seems certain that casein production in 1939 was generally low. In the first place, the United States only produced a small quantity owing to the drought; the period of activity of the factories finished comparatively early. Owing to the generally heavy demand, prices rose very sharply in the first month of the war. In Argentina the price of casein of marketable quality was 500 pesos per metric ton (2,200 lb.) against 150 pesos in April.

On the American market the maximum price of 1928-29 was exceeded. In Great Britain and France quotations became nominal. A further rise was generally anticipated. But prices had already begun to quieten down in November and at the end of the year prices in Argentina were around 400 pesos. The extent of requirements had evidently been overestimated.

The importance of casein from the point of view of war needs lies principally in its use for the manufacture of paints and glues, while its extensive use in paper manufacture does not come under this head. It is not yet known if new uses have contributed to the demand. It is known that in Germany it was intended to add casein to better quality soaps to reduce the losses caused by the formation of lime soaps, as that has occurred for a long time in the cases of varieties marketed under the name of "buttermilk" soaps.

The competition, mentioned in the article published last year, in the by-products of butter manufacture between human consumption on the one hand and the various industrial uses on the other has just entered a new phase. Competition between these two requirements will be severe during the present war and some equilibrium will have to be found.

In this connection there must also be mentioned the utilization of soya in the manufacture of casein. Here also there is competition for the raw materials similar to that for the manufacture of milk casein. In this case, however, it is not man but livestock that compete with the industrial use. The economic question in this case takes another aspect is it more advantageous to produce the casein directly from defatted soya or to give the soya to the animal, which then produces not only a quantity of casein naturally smaller but also fat and meat

As a result of the rise in the prices of lactic acid casein, the expensive manufacture of casein for textiles is likely to be no longer practical unless in other spheres, which must be considered, there are also rises in prices. If the interested circles, on consideration of the general situation, believe that casein wool (Lanital) will be of much greater importance the experiments on its manufacture with lactic acid casein will acquire correspondingly greater importance.

For the production of casein in the different countries in the year just completed it is now possible to give more data than last year, despite the present difficulties in obtaining statistics. Though the data still show gaps, they demonstrate sufficiently clearly a regression in comparison with last year.

Production of Casein.

(ooo lb.)

COUNTRIES	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930
United States (a)	34,549	48,549	67,467	46,140	37,638	37,331	24,087	35,335	41,965	30,537
Argentina	(1)34,549	36,822	43,266	42,953	38,083	45,907	47,708	43,277	32,055	36,193
France			27,902	—	—	—	—	—	—	(1) 33,069
Germany	(1)11,962	19,608	12,527	2,268	750	—	—	—	—	—
Italy		...	9,921	—	—	—	—	—	—	—
New Zealand		7,866	9,738	—	—	—	—	—	—	—
Norway	6,393	7,165	7,067	6,962	2,883	3,115	2,391	1,964	1,857	2,803
Netherlands	4,543	5,277	5,388	2,178	2,866	—	—	—	—	—
Australia (4)	..	6,163	5,014	3,731	2,424	2,573	1,766	1,365	2,569	3,340
Canada		1,498	998	1,336	1,204	1,904	738	367	—	—
Estonia			439	467	470	423	175	88	257	461
Hungary	...	377	411	504	204	130	159	64	189	1,040
Sweden	{(a)		233	86	105	158	97	—	29	203
	{(b)	...	113	274	427	431	57	52	11	797
Bulgaria	...		40	21	—	—	—	—	—	—
Bohemia Moravia	...		817	—	—	—	—	—	—	—

(a) Dried — (b) Crude

(1) Eleven months (January to November) — (2) Semi official estimates — (3) Nine months (January to September) — (4) Commercial year ending on June 30 of the year indicated

Production in the United States in 1939 was, according to non-statistical information, relatively small. Production in 1938 remained appreciably under the 1937 level but was all the same very large.

For the United States the exactitude of the official figures of production and consumption of casein is doubted by American experts. In-admissible conclusions would be reached if it were admitted that, according to the official

statistics, the share of the paper industry in the consumption of casein had risen from 63.5 per cent. of the total available in 1929 to 87.5 per cent. in 1935. It is said that the figures of the Bureau of Agricultural Economics were too low (this question is examined in detail by E. Sutermeister in "Casein and its industrial applications", second edition, New York 1939, pp. 398-403).

For Argentina there is added in the table—with a correction of an error last year—the complete series for casein production. For previous years it should be mentioned that production, which was about 4,400,000 lbs in 1916, rose very rapidly and in 1921 had already attained 22,000,000 lbs and in 1926 43,790,000 lbs. This represents not only double the 1921 figure but a tenfold increase in ten years. The total then reached was not exceeded in the following ten years.

For 1939 the December data are still lacking. For the period from January to September production was smaller than last year, which in turn was smaller than that of the six preceding years. In October and November, however, there may be observed an appreciable increase due in part to changes in the world market. It is not improbable that there will be a total quantity equal to that produced in 1938. Moreover it would be no wise surprising if 1940 production exceeded all the preceding maxima.

In France also a small production was indicated for the summer of 1939. By some experts however, a larger figure was given, based on the often better than average production of fodder, and the wiping out on a large scale of foot-and-mouth disease. The latter undoubtedly reduced the 1938 production with reference to that of 1937. The relative quantities would have been absorbed already in 1939 by the armament industry.

The data of Germany include the production of the first nine months, January to September only. Although there is not for the preceding year a distribution by months, it would seem that the quantity recorded, which attains almost the total of 1937, was smaller than that of the corresponding period of the previous year. As the statistics of external trade of Germany from January to July reveal a remarkable recovery in imports with a particularly large increase for Argentina, rising from 5,661,000 lbs in 1938 to 13,620,000 lb. in 1939, the possibility of supplies at advantageous prices by means of imports must be considered as a cause of reduction in the country's own output. For the last 3 months of 1939, however, which in normal years have a small casein production, it must be admitted that there was the most intense activity in Germany, owing to the raw material furnished by the intensification of the production of butter as a war measure.

For the Netherlands there is now also recorded the quantity of rennet casein. This represents one part of the total indicated in the table; it was 2,030,000 lbs in 1938 and 990,000 lbs in 1939, thus showing an exceptionally heavy decrease.

For Italy official data for the most recent period are lacking. The production of textile casein is said to have risen from about 1,500,000 lbs in 1937 to 3,300,000 lbs in 1938.

The total production of casein in the countries appearing in the table of production and export may be estimated for 1938 at about 192,000,000 lbs and for 1937 at between 174,000,000 lbs and 176,000,000 lbs. With more complete information, we revise the figure given last year for 1936 to 168,000,000 lbs and for 1935 to 128,000,000-130,000,000 lbs.

The total production of 1939 does not seem to have exceeded that of preceding years. It is even probable that it was smaller. Production in relation to demand in the second half of 1939 is particularly small and this is more important than the above comparison.

The data for 1939 on international trade are unfortunately very incomplete. As the reports for a number of the most important countries finish in summer or autumn, there has been inserted for 1938 a second column with comparable figures. When the estimate is complete for 1939 no figure is given in this column. The data indicate in general an intensification of trade.

Exports of Casein.

(000 lb.)

COUNTRIES	1939	1938 A	1938 B	1937	1936	1935	1934	1933
Argentina	45,798	—	29,436	34,117	43,945	37,620	44,825	50,792
France	(¹) 14,216	(²) 13,002	n) 20,721	n) 22,189	n) 33,554	n) 26,069	n) 21,387	(g) 20,960
New Zealand	(¹) 4,242	(¹) 4,217	4,637	8,684	9,054	7,299	6,467	5,451
Netherlands	n) 4,877	—	(g) 4,669	(g) 3,865	g) 1,608	(g) 985	1,592	384
Norway	2,375	—	2,262	2,589	2,758	2	1,438	343
Denmark	1,618	—	1,685	4,402	2,511	925	2,817	79
Australia	(¹) 295	—	1,428	2,060	1,888	1,594	1,264	1,051
India	(²) 616	—	841	1,409	1,283	891	919	874
Germany	(¹) 419	(²) 763	920	783	732	1,232	1,328	2,238
Italy	(¹) 2	(²) 600	834	25	165	195	1,212	1
Estonia	—	—	312	616	463	752	366	23
Finland	(¹) 159	(¹) 88	264	291	533	74	...	...
Sweden	—	—	267	183	316	324	480	190
Hungary	—	—	2	165	371	1	15	656
United Kingdom	—	—	105	124	253	318	350	245
re exports	—	—	183	280	225	488	1,737	86
Belgium Luxembourg	(¹) 78	(¹) 86	115	124	195	166	347	219
Canada	—	—	0	3	58	—	3	—
Latvia	...	—	—	—	5	22	41	—
Lithuania	—	—	...	6	—	...	...	...
Switzerland	1	—	1	22	4	5	12	1
Bohemia Moravia (¹)	(¹) 221	(¹) 1	1	225	11	0	31	1

4 Quantities for the months to which the 1939 data relate — B Full year

(n) Net weight — (g) Gross weight

(1) Fiscal year ending June 30 of the year indicated — (2) Fiscal year ending March 31 of year stated — (3) Up to July 31. — (4) Up to August 31 — (5) Up to November 30 — (6) Up to March 15, 1939 the data refer to Czechoslovakia

Particularly Argentina, after the decline in its exports in recent years, has been able to intensify them again to a remarkable degree. It has been unable to attain the maximum of 1933 but has exceeded the figure of 1934, which was second in importance. It must be noted that larger quantities were

exported in September and October but what is most remarkable is that on the other hand monthly exports decreased in November by about one-third.

Exports from France in the first seven months of 1939 exceeded those of 1938. Since, however, according to reports, only small quantities have been exported during the war it seems problematic whether the quantities exported in 1938, which were not large, were attained.

The direction of French exports have been modified considerably. In the first seven months of the preceding year Germany and Great Britain imported almost the same quantity, namely 4,400,000 lb. In 1939, however, Germany's share fell to 1,650,000 lb., though the total German imports increased. The imports of Great Britain rose to 6,600,000 lb., almost half of the total exports of France.

The exports of Australia underwent a severe decline because that country was able to ship to Japan only something less than one-tenth of the exports of the preceding year.

Amongst the countries exporting small quantities Germany and particularly Italy show heavy reductions with respect to the corresponding period of 1938.

For imports the gaps in the statistics are still more felt. However, complete results are available for the largest importing countries, namely the United States and Japan. In these two cases there may be noted a very appreciable intensification of imports, particularly into the United States, thus again demonstrating the exceptionally large variability in their import requirements. As causes of this heavy import in the last year may be reckoned the reduction in that country's own production and the favourable conditions of purchase of Argentine casein. In general it must be noted that there is no numerical compensation in the fluctuations of production by the addition of the quantities imported in the same year or in the following year, since the calendar year does not contain the corresponding subdivision. In reality the quantities available will certainly not show the irregular movement that such a calculation would give. The volume of available stocks may also influence the additional requirements. In general a heavy increase in consumption in the United States is apparent.

In Japan the intensification of imports has been less marked than a year ago but they reach their second highest annual total.

In the United Kingdom imports of casein and raw materials derived from it, including galatite, in the period from January 1 to August 31, rose from 12,800,000 lbs in 1938 to 16,300,000 lbs in 1939. In 1938 the proportion of casein converted was, as in preceding years, about one-twentieth of the total annual imports. As it is not probable that the increase in Germany continued at the same rate as during the first part of the year, it can be believed that the United Kingdom this year took the first place amongst importing countries. This change was to be foreseen in view of the increase in Germany's own production.

For the Netherlands also there had been a very appreciable increase in imports.

Thus we have a general view of the situation that is somewhat surprising at first sight, since in 1939 the production of the surplus-producing coun-

Imports of Casein.

(ooo lb.)

COUNTRIES	1939	1938 <i>A</i>	1938 <i>B</i>	1937	1936	1935	1934	1933
Germany	(⁴) 12,717	(¹) 11,925	18,891	25,072	39,132	35,478	44,174	36,226
United Kingdom	—	—	17,955	20,339	15,856	18,940	20,857	14,840
Japan	11,111	—	8,023	15,052	10,153	9,862	8,327	7,885
United States	12,423	—	417	5,120	16,209	3,230	1,491	8,141
Finland	(⁶) 4,120	(⁶) 3,425	4,925	4,434	3,717	2,680	2,824	2,331
Italy	(⁴) 3,016	(⁴) 3,136	4,732	3,365	226	1,701	2,151	4,245
Bohemia-Moravia (7)	(⁴) 1,001	(⁴) 1,404	2,132	3,118	2,693	2,310	2,333	1,128
Belgium-Luxemburg	(⁴) 2,550	(⁴) 1,943	2,122	3,068	2,721	2,138	1,416	1,863
Austria	(²) 941	(²) 558	2,006	2,465	2,251	2,038	1,787	1,388
Sweden	—	—	2,501	2,069	1,995	1,612	1,380	1,767
Netherlands	(ⁿ) 2,906	—	(ⁿ) 1,768	(^g) 1,358	(^g) 937	(^g) 995	(^g) 2,195	700
Spain	—	—	—	—	—	2,703	2,572	2,487
Poland	(²) 336	(²) 957	1,447	797	757	378	521	—
Latvia	—	—	58	826	1,433	1,508	1,592	983
Switzerland	801	—	562	1,185	810	1,463	1,189	915
Norway	—	—	505	470	543	554	346	327
Canada	—	—	227	402	140	111	56	47
Lithuania	—	—	206	383	324	269	368	55
Estonia	—	—	144	289	157	277	597	602
Denmark	—	—	—	26	133	199	227	219
Australia	51	—	72	31	39	40	8	71
Romania	—	—	—	6	15	4	2	39
Bulgaria	—	—	10	3	4	5	4	7
Hungary	—	—	2	0	0	167	8	1

A : Quantities for the months to which the 1939 data relate.*B* : Full year.

(n) Net weight, — (g) Gross weight.

(1) Fiscal year ending June 30 of the year indicated. — (2) Up to March 31. — (3) Up to June 30. — (4) Up to July 31. — (5) Up to August 31. — (6) Up to November 30. — (7) Up to March 15, 1939 the data refer to Czechoslovakia.

tries as well as that of the countries with insufficient production was relatively small and nevertheless the volume of international trade showed a notable increase. This phenomenon is partly explained by the fact that there were still large stocks, which have since been marketed and on the other hand the armament industries and other wartime requirements had created a heavy demand.

Price movements in the first two months of 1940 showed some further increases, after business after the end of the year had been relatively quiet. These increases were evidently due to the particularly unfavourable weather conditions for livestock and milk production. It is very probable that there will be further price increases. As long as the war continues and large quantities of casein will be necessary for the armament industry, particularly for aeroplane manufacture, demand will remain intense. On the other hand, this demand is no wise unlimited, as the reactions in the last two months of 1939 have shown.

W. SCHUBRING.

CURRENT INFORMATION ON LIVESTOCK AND DERIVATIVES.

Hungary: The condition of stock at the beginning of March was on the whole satisfactory.

Ireland: Milk production in February was slightly below normal for the season, owing to inclement weather

Netherlands In spite of the great difficulties caused by snow and frost in January feeding conditions for dairy herds were not too unfavourable. The situation, however, is rather precarious. Milk production in the country as a whole was 7.5 per cent lower than in January last year. In Overijssel and Zuidholland production was about the same, but in Gelderland and Noordbrabant it was 15 per cent. lower, in Utrecht 12.5 per cent. less, in Groningen 10 per cent., in Noordholland 9 per cent., in Friesland 6 per cent., and in Drente and Zeeland 5 per cent. less.

Feed supplies in February varied from satisfactory to inadequate, particularly in the pasture areas, where it was below normal. The severe frosts and the very limited supplies of hay and fodder had a very unfavourable effects on milk production, which fell about 11 per cent. compared with February last year.

The percentage decreases in the respective provinces were Groningen 5 per cent., Overijssel 7.5, Zeeland 8.5, Friesland and Drente 9, Zuidholland and Limburg 10, Utrecht 12.5, Noordholland and Noordbrabant 14.5 and Gelderland 15 per cent.

Union of South Africa Dry, hot weather prevailed in January not only in the winter-rainfall areas but also, except for some scattered showers and storms, in the summer-rainfall region. Grazing in most areas was still adequate, however, and stock generally were in fair condition, but rain was needed, particularly in the summer-rainfall region.

LATEST INFORMATION**PRODUCTION.**

Belgium: According to the latest estimates of the Ministry of Agriculture, the production of the principal crops in 1939, compared with 1938 and the average of 1933-1937 is as follows.

	1939	1938	Average 1933-37	1939	1938	Average 1933-37	% 1939 1938	Average = 100
	ooo centals			ooo bushels				
Wheat	7,693	12,079	9,550	12,822	20,131	15,926	63.7	80.5
Rye	7,703	8,489	8,760	13,755	15,158	15,643	90.7	87.9
Barley	1,127	1,967	2,046	2,348	1,098	1,263	57.3	55.1
Oats	15,967	13,692	15,361	19,865	42,738	48,002	116.6	103.9
Meslin	83	00	96	143	156	166	92.1	86.5
Potatoes . . .	73,264	71,836	71,759	122,104	119,725	119,596	102.0	102.1
Sugar beet . .	36,802	26,492	33,546 ⁽¹⁾	1,840 ⁽¹⁾	1,325 ⁽¹⁾	1,677	138.9	100.7
Linseed	553	355	263	987	634	170	155.8	210.0
Flax (fibre) . .	1,031	781	356 ⁽²⁾	103,053 ⁽²⁾	78,064 ⁽¹⁾	35,593	132.0	286.5

(1) Thousand short tons. — (2) Thousand lb.

TRADE**INTERNATIONAL TRADE IN SOME IMPORTANT AGRICULTURAL PRODUCTS SINCE THE BEGINNING OF THE WAR**

It may be of interest to examine whether, since the outbreak of hostilities, the volume of international trade in a number of important agricultural products has undergone variations as compared with last year. The commodities considered in the following pages are wheat, maize and rice among the cereals, butter, coffee, tea and cacao among food products other than cereals; linseed, soybeans, copra and groundnuts among the oil-yielding crops, cotton, wool and jute among the textiles and, finally, rubber. These fifteen products normally represent nearly half the total value of trade in agricultural products.

Several importing countries, belligerent and neutral, having suspended publication of their trade statistics, information on the volume of trade can now be obtained only from the statistics of the exporting countries, though these in some cases are not very recent. We have accordingly given the figures available on the quantities of each product shipped by the principal exporting countries from September to December 1939 and from September to December 1938.

In view of the relative importance of the countries considered in each case in the international trade in the selected commodities, the recent trend of trade in these products is sufficiently accurately indicated by the figures in the following pages.

Wheat. — The exports of the six countries appearing in the following table were equivalent, on the average of the years 1934 to 1938, to four-fifths of the world wheat trade.

Exports of Wheat.

(thousand bushels)

Countries	September to December	
	1939	1938
Canada	87,535	74,880
Argentina	61,646	15,466
Hungary	17,011	10,917
Romania	15,120	16,865
United States	6,280	15,832
Australia	9,204	12,008
Total . . .	196,796	145,968

In each of the four months considered, exports were larger than in the corresponding month of 1938 but the greatest increase was recorded in December, as the following figures show:

(thousand bushels)		
Months	1939	1938
September	39,830	31,199
October	43,652	40,906
November	51,858	41,084
December	61,456	32,779
Total	196,796	145,968

The unusually great increase of exports in December was largely due to the jump in Canadian exports which in this month were 34,412,000 bushels as compared with 15,983,000 in the same month in 1938

It is to be noted that a large proportion of the wheat exported by Canada was not shipped to its final destination but stored in the United States before shipment. Visible stocks of Canadian wheat held in the United States increased from 6,855,000 bushels at the beginning of September 1939 to 38,784,000 at the beginning of January 1940. Between September 1938 and January 1939 the increase was much smaller (541,000 to 7,874,000 bushels). After allowance is made for this, the quantity actually shipped from the countries listed above may be estimated at about 160,576,000 bushels for the period September 1 to December 31, 1939, against 132,593,000 bushels in the same months of 1938.

Maize. Argentina, the United States, the Union of South Africa, Indochina and Romania supplied 85 per cent. of the world maize exports in the years 1934 to 1938. Their exports in the months September to December of 1939 and 1938 were as follows:

Exports of Maize
(thousand bushels)

Countries	September to December	
	1939	1938
Argentina	33,187	56,508
United States	13,792	21,613
Union of South Africa	12,592	4,821
Indochina	8,685	10,790
Romania	3,550	5,342
Total	71,806	99,074

From September to November exports were much smaller than those of 1938:

(thousand bushels)			
Months		1939	1938
September	. . . . .	20,400	20,090
October	. . . . .	17,733	25,123
November	. . . . .	14,144	24,747
December	. . . . .	10,529	19,214
		---	---
Total	.	71,806	99,074
		====	====

Rice. — If the trade between Japan, Chosen and Taiwan, which may be considered as internal trade, is ignored, the exports of Thailand, Burma and Indochina represent three-quarters of the total quantity of rice placed on the international market

The exports of these three countries in the months September to December were as follows:

<i>Exports of Rice</i>			
(million lb)			
Countries		September to December 1939	1938
Thailand	. . . . .	1,460	804
Burma	. . . . .	1,467	1,349
Indochina	. . . . .	945	446
		---	---
Total	.	3,872	2,689

The exports of each month in 1939 were substantially greater than those of the corresponding month of 1938:

(million lb)			
Months		1939	1938
September	. . . . .	1,130	655
October	. . . . .	970	713
November	. . . . .	794	652
December	. . . . .	978	669
		---	---
Total	. . .	3,872	2,689

Butter. -- Denmark, the Netherlands, Australia and New Zealand together contribute about 70 per cent. of world exports. Their exports in the last four months of 1939 and 1938 were as follows:

<i>Exports of Butter.</i>		
(million lb.)		
Countries	September to December	
	1939	1938
Australia	107 8	96 4
Denmark	107 1	107 7
New Zealand	94 1	89 4
Netherlands	31 6	30 6
Total	340 6	324 1

The exports by months of these four countries were as follows:

(million lb.)		
Months	1939	1938
September	72 8	71 2
October	84 9	71 5
November	84 3	99 1
December	98 6	82 3
Total	340 6	324 1

Coffee. -- Brazil, Colombia, the Netherlands Indies, Guatemala, Venezuela and Salvador supply about four-fifths of total exports.

The exports of these countries in the period from September to December were as follows:

<i>Exports of Coffee.</i>		
(million lb.)		
Countries	September to December	
	1939	1938
Brazil	814 3	737 1
Colombia	160 7	175 4
Netherlands Indies	42 9	64 5
Guatemala	22 3	30 6
Venezuela	9 7	15 7
Salvador	8 2	14 0
Total	1 064 1	1 038 2

The total exports of these countries by months were as follows:

(million lb)		
Months	1939	1938
September	259 6	256 9
October	330 2	278 8
November	276 4	236 4
December	197 9	266 1
	<hr/>	<hr/>
Total . . .	1 064 1	1 038 2
	<hr/>	<hr/>

Tea. — India, Ceylon, the Netherlands Indies and China export about four-fifths of the tea placed on the international market. The following quantities were exported in the last four months of 1939 and 1938.

Exports of Tea

(million lb)		
Countries	September to December	
	1939	1938
India	166 8	180 7
Ceylon	72 0	72 1
Netherlands Indies	53 0	52 0
China	20 6	38 0
	<hr/>	<hr/>
Total . . .	312 4	342 8
	<hr/>	<hr/>

Exports from September to November were lighter than those of the corresponding months of 1939 but the exports of December were a good deal heavier:

(million lb)		
Months	1939	1938
September	84 5	97 7
October	70 6	83 2
November	64 3	86 7
December	93 0	75 2
	<hr/>	<hr/>
Total . . .	312 4	342 8
	<hr/>	<hr/>

Cacao. — The Gold Coast, Brazil, Nigeria and the Dominican Republic export nearly three quarters of the cacao that figures in international trade. The exports of these countries from September to December were as follows:

<i>Exports of Cacao.</i>		
(million lb.)		
Countries	September to December	
	1939	1938
Gold Coast	150.4	186.0
Brazil	108.9	116.1
Nigeria	52.6	51.3
Dominican Republic	6.8	10.0
Total . . .	318.7	363.4

Exports in September and October 1939 were higher than in the corresponding months of 1938, but were relatively lower in November and much lower in December:

(million lb.)		
Months	1939	1938
September	89.9	82.3
October	59.6	47.0
November	73.2	76.7
December	96.0	157.4
Total . . .	318.7	363.4

Linseed. — Argentina, British India and Uruguay supply almost the whole of world linseed exports.

The exports of these three countries in the last four months of 1939 and 1938 were the following:

<i>Exports of Linseed.</i>		
(million lb.)		
Countries	September to December	
	1939	1938
Argentina	549.4	1,068.3
British India	109.8	207.8
Uruguay	31.7	59.2
Total . . .	690.9	1,335.3

The aggregate exports each month during this period were consistently lower than in 1938.

(million lb.)		
Months	1939	1938
September	260 4	273 3
October	129 9	348 6
November	135 2	277 9
December	165 4	435 5
Total	<u>690 9</u>	<u>1,335 3</u>

Soya-beans. — About nine-tenths of world exports of soya-beans come from Manchukuo. The quantity exported from this country from September to November 1939 totalled 231.3 million lb, against 878.1 in the corresponding period of 1938.

Copra. — The exports of the Netherlands Indies, Malaya and Ceylon represent about half the world trade in this product. Information is not available for the Philippines which is the most important exporter after the Netherlands Indies and which supplies about 20 per cent. of the total exports.

The figures of the three countries mentioned for the last quarter of 1939 and 1938 are shown below

Exports of Copra.

(million lb)		
Countries	September to 1939	December 1938
Netherlands Indies	308 1	400 2
Malaya	104 9	177 6
Ceylon	33 2	74 9
Total	<u>446 2</u>	<u>652 7</u>

In September and October in particular, exports were much lighter than in 1938 but the difference was smaller in November and December.

(million lb)		
Months	1939	1938
September	107 5	179 7
October	85 6	162 7
November	135 8	169 9
December	117 3	140 4
Total	<u>446 2</u>	<u>652 7</u>

Groundnuts. — Of the three major exporters of groundnuts (India, French West Africa and Nigeria), India alone has published figures of trade in the last four months of 1939. Indian exports during this period, compared with those of the same months in 1938, are shown below:

Exports of Groundnuts from India.

Months	(million lb.)	1939	1938
September		59 8	196 4
October		31 0	160 3
November		82 4	160 2
December		24 6	135 6
		-	-
Total		197 8	658 5

Cotton. — The United States, India, Egypt, Brazil, Peru and China supply about four-fifths of the total exports of cotton. Their exports in the last four months of 1939 and 1938 were as follows:

Exports of Cotton.

Countries	(million lb.)	September to December 1939	1938
United States		1 546 0	902 0
India		248 0	328 1
Egypt	(1)	337 8	(1) 276 4
Brazil		76 0	117 7
Peru		71 3	65 3
China		2 6	89 9
		-	-
Total		2,281 7	1,779 4

(1) Excluding December

In each of the four months considered, exports were heavier in 1939.

Months	(million lb.)	1939	1938
September		522 7	411 1
October		661 6	471 3
November		473 8	483 6
December	(1)	623 6	(1) 413 4
		-	-
Total		2,281 7	1,779 4

(1) Excluding Brazil.

Wool. — The exports of Australia, New Zealand, Argentina, the Union of South Africa and Uruguay amounted on the average, in 1934 to 1938, to about three quarters of world wool exports.

The available export statistics of these countries in the last four months of 1939 and 1938 are as follows:

Exports of Wool.

(million lb.)

Countries	September to December	
	1939	1938
Australia	252 1	390 9
New Zealand	8 7	43.2
Argentina	80 7	107.4
Union of South Africa	51 0	104 1
Uruguay	24 9	38 5
Total	<u>417 4</u>	<u>684 1</u>

Exports in September and October, show a particularly heavy drop compared with 1938; moreover, the data for November and December also show a considerable fall from the corresponding figures of 1938:

(million lb.)

Months	1939	1938
September	37 8	86 3
October	41 0	135 1
November	153 4	217 1
December	185 2	245 6
Total	<u>417 4</u>	<u>684 1</u>

Jute. — In the case of jute, almost the entire international trade is supplied by India. The exports of this country from September to December 1939 and 1938 were as follows:

Exports of Jute from India.

(million lb.)

Months	1939	1938
September	102 6	149 1
October	72 8	148 2
November	144 6	186 5
December	136.0	157 2
Total	<u>456.0</u>	<u>641.0</u>

Rubber. — More than four-fifths of the world rubber exports come from Malaya the Netherlands Indies and Ceylon. The exports of these countries in the months September to December 1939 and 1938 were as follows:

Exports of Rubber

(million lb.)

Countries	September to December	
	1939	1938
Malaya	463	348.4
Netherlands Indies	306.7	178.4
Ceylon	56.5	13.1
Total	826.2	540.4

In each of the four months exports were larger in 1939 than in 1938.

(million lb.)

Months	1939	1938
September	199.8	141.5
October	• 1	171.3
November	• 188.3	145.4
December	• 160.2	106.4
Total	566.7	570.4

Conclusion. The statistics of the various products considered in this article indicate that the trend of world trade since the outbreak of hostilities has not been uniform but differs from one product to another.

Exports during the period from September to December 1939 were considerably higher than those of the corresponding period of 1938 in the case of wheat, rice, cotton and rubber, considerably lower in the case of maize, oilseeds (linseed, soya-beans, groundnuts and copra), wool and jute. In the case of butter, coffee, tea and cacao the difference between the totals of the two periods were relatively small.

Clearly it would be incorrect to attribute the variations exclusively to the direct or indirect effects of the war, but in all probability to a large extent the changes in the volume of trade are connected therewith.

For example, the increase in wheat exports may be explained by the tendency of the importing countries to build up as large stocks as possible of this vital commodity, in case of need, the same largely applies to rice. In the case of cotton and rubber the relation between the extension of trade and special requirements in the present situation is evident. In addition, the heavy fall in exports of wool and jute may be related to the measures taken by the British Government for controlling the supplies of these products in the Dominions and India. The drop in exports of oilseeds is largely connected with the present difficulties and risks of transport to the ports of Northern Europe, to which a considerable part of these exports is normally directed.

The following countries, having suspended publication of trade statistics, do not appear in the tables Germany, Bohemia Moravia (Protectorate), Spain, Estonia, Finland, France, Ireland, Italy, Latvia, U S S R, Iraq, Syria and Lebanon, Algeria, Madagascar, French Morocco, Tunisia, Austria

COUNTRIES	JANUARY				SIX MONTHS (August 1 January 31)				TWELVE MONTHS (August 1 July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939 4	1938 39	1939 40	1938 39	1938 39	1937 38
Wheat. — Thousand centals (1 cental = 1 lb)										
<i>Exporting countries</i>										
Bulgaria	457	0	0	0	2 221	0	0	0	2 097	0
Hungary	963	821	0	0	14 677	8 632	0	0	16 316	0
Romania	1 676	2 583	0	0	11 674	14 964	0	0	27 571	0
Yugoslavia					(1) 3 909	(1) 2 421	(1) 0	(1) 0	3 235	0
Canada	6 215	4 727			64 901	53 416			67 746	935
United States	365	6 130	563	513	7 675	21 569	3 011	2 647	46 003	6 134
Argentina	7 731	5 707			54 059	17 876			69 975	
Chile					(3) 1	(3) 0	(3) 0	(3) 3	0	4
Uruguay					(1) 1 106	(1) 586	(1) 1	(1) 3	2 413	8
India by sea	12	9	121	704	108	1 934	555	2 347	1 984	4 421
by land					(4) 112	(4) 97	(4) 18	(4) 30	443	132
Iran					(1) 0	(1) 0	(1) 0	(1) 0	0	0
Manchuria					(4) 0	(1) 0	(4) 3	(1) 2	0	16
Turkey	7	302			58	935			1 098	
Egypt					(1) 1	(1) 1	(1) 20	(1) 0	1	60
<i>Importing countries</i>										
Belgo Luxemb L U					(1) 258	(1) 112	(1) 11 728	(1) 11 168	2 219	24 891
Denmark	0	1	225	268	29	39	1 351	1 574	40	2 364
Greece	0	0	357	361	0	0	3 363	3 076	0	7 740
Norway	0	0	728	178	0	0	4 045	1 927	0	4 002
Netherlands	0	1	844	950	2	15	6 830	7 969	21	15 623
Portugal					(1) 0	(1) 0	(1) 724	(1) 1 161	0	1 295
Mexico					(3) 0	(3) 0	(3) 13	(3) 46	0	1 243
Brazil							(2) 6 273	(2) 7 529		23 172
India					(2) 0	(1) 0	(1) 1 181	(2) 903	0	2 625
Burma	0	1	4	8	5	3	36	48	7	68
Ceylon			1	1			49	33		91
China					(1) 157	(1) 120	(1) 700	(1) 11	511	9 597
Japan					(1) 0	(1) 0	(1) 11	(1) 22	0	86
Indochina							(3) 3	(3) 0		14
Japan					(1) 0	(1) 0	(1) 1	(1) 2	0	7
British Malaya							(1) 274	(1) 233		679
Palestine					(1) 2	(1) 1	(1) 13	(1) 6	4	16
Union of South Africa					(1) 0	(1) 0	(1) 306	(1) 420	0	1 791
New Zealand					(2) 0	(2) 0	(2) 103	(2) 1 022	0	1 030
					(2) 0	(2) 0	(2) 228	(2) 321	0	2 006
Rye. — Thousand centals (1 cental = 1 lb)										
<i>Exporting countries</i>										
Bulgaria	0	0	0	0	0	0	0	0	0	0
Hungary	4	22	0	0	271	175	0	0	309	0
Romania	172	0	0	0	787	45	0	0	640	0
Yugoslavia					(1) 0	(1) 0	(1) 0	(1) 0	0	0
Canada					(1) 1 634	(1) 469			984	0
United States	49	0	0	0	98	374	0	0	374	0
Argentina	683	135			2 973	193			2 064	
Turkey	1	0			27	11			177	
<i>Importing countries</i>										
Belgo Luxemb U P					(1) 0	(1) 17	(1) 1 183	(1) 2 865	32	6 863
Denmark	0	0	252	202	0	0	1 103	1 177	1	2 061
Greece	0	0	0	0	0	0	0	0	0	0
Norway	0	0	23	224	0	0	1 747	1 612	0	2 734
Netherlands	0	205	0	141	1	850	198	446	976	1 649
Palestine							(1) 147	(1) 71		188

(1) Up to December — (2) Up to November 30 — (3) Up to October 31 — (4) Up to September 30

COUNTRIES	JANUARY				SIX MONTHS (August 1-January 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Wheat Flour. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries</i>										
Bulgaria	0	0	0	0	2	2	0	0	3	0
Hungary	194	40	0	0	1,190	448	0	0	1,027	0
Romania	0	0	0	0	1	2	0	0	2	0
Yugoslavia	...	...	...	...	(1) 17	(1) 20	(1) 0	(1) 0	32	0
Canada	1,422	744	...	...	6,744	4,620	...	...	9,024	145
United States	851	999	0	0	6,571	5,516	95	81	14,057	160
Argentina	121	156	—	—	1,053	960	—	—	2,049	—
Uruguay	...	...	...	...	(1) 206	(1) 161	(1) 0	(1) 0	408	0
Chosen	...	...	...	...	(1) 132	(1) 292	(1) 0	(1) 0	523	0
India by sea	98	120	0	0	699	724	2	1	1,172	4
Iran	...	...	...	...	(1) 0	(1) 0	(1) 0	(1) 0	0	0
Japan	...	...	...	...	(1) 2,721	(1) 2,749	(1) 60	(1) 0	4,594	0
Turkey	0	4	—	—	1	39	—	—	75	—
<i>Importing Countries</i>										
Belgo-Luxemb 3, U.	...	...	...	...	(1) 17	(1) 35	(1) 57	(1) 9	95	40
Denmark	0	1	3	44	19	15	98	282	33	540
Greece	0	0	2	2	0	0	22	18	0	43
Norway	0	0	63	1	1	4	608	494	6	820
Netherlands	0	0	226	143	4	3	1,099	745	5	1,829
Portugal	...	...	...	...	(1) 0	(1) 0	(1) 10	(1) 22	0	38
Haiti	...	...	...	...	—	—	(1) 79	(1) 69	—	177
Mexico	...	...	...	...	(3) 0	(3) 0	(3) 1	(3) 0	0	2
Brazil	...	...	...	...	—	—	(2) 261	(2) 372	—	798
Chile	...	...	...	...	(3) 0	(3) 0	(3) 20	(3) 14	2	93
Peru	...	...	...	...	(2) 0	(2) 0	(2) 12	(2) 15	0	42
Burma	0	0	88	80	1	0	409	358	1	865
Ceylon	...	...	38	26	—	—	271	197	—	366
China	...	...	...	...	(1) 481	(1) 161	(1) 3,059	(1) 2,291	1,176	7,108
Formosa	...	...	...	...	(3) 2	(3) 0	(3) 0	(3) 0	8	0
Netherlands Indies	...	...	...	...	—	—	(1) 657	(1) 579	—	1,271
Java and Madura	...	...	...	...	—	—	(2) 315	(2) 250	—	746
Outer Provinces	...	...	...	...	—	—	(1) 116	(1) 276	4	719
Indochina	...	...	...	...	(1) 0	(1) 0	(1) 756	(1) 618	134	1,535
British Malaya	...	...	...	...	(1) 68	(1) 59	(1) 2,360	(1) 1,143	0	5,592
Manchukuo	...	...	...	...	(4) 0	(4) 0	(4) 308	(4) 185	0	415
Palestine	...	...	...	...	(1) 0	(1) 0	(1) 20	(1) 16	0	46
Egypt	...	...	...	...	(1) 1	(1) 0	(1) 4	(1) 3	2	9
Union of South Africa	...	...	...	...	(2) 2	(2) 1	(2) 0	(2) 0	0	1
New Zealand	...	...	...	...	(2) 0	(2) 0	(2) 0	(2) 0	0	0
Barley. — Thousand centals (1 cental = 100 lb)										
<i>Exporting Countries</i>										
Bulgaria	0	0	0	0	0	0	0	0	0	0
Denmark	6	306	0	0	298	1,675	12	9	3,002	21
Hungary	24	11	0	0	138	59	0	0	107	0
Romania	0	104	0	0	2,329	2,465	0	0	4,195	0
Yugoslavia	...	...	...	...	(1) 3	(1) 0	(1) 9	(1) 8	1	21
Canada	...	...	...	...	(1) 5,193	(1) 5,051	...	...	7,919	1
United States	89	174	5	0	1,329	3,918	141	0	5,041	237
Argentina	1,674	445	—	—	3,050	760	—	—	4,644	—
Chile	...	...	...	...	(3) 53	(3) 275	—	—	1,076	—
India by sea	1	1	9	6	7	35	205	26	39	79
Iran	...	...	...	...	(1) 78	(1) 26	(1) 0	(1) 0	97	0
Manchukuo	...	...	...	...	(4) 0	(4) 1	—	—	5	—
Turkey	85	211	—	—	(1) 241	(1) 1,627	(1) 0	(1) 7	2,740	—
Egypt	...	...	...	...	(1) 1	(1) 62	(1) 0	(1) 0	68	19
Union of South Afr	...	...	...	...	(2) 0	(2) 0	(2) 0	(2) 0	1	0
<i>Importing Countries</i>										
Belgo-Luxemb E U	...	...	...	...	(1) 8	(1) 129	(1) 2,980	(1) 5,346	217	10,406
Greece	0	0	6	50	0	0	48	222	0	344
Norway	0	0	42	20	0	0	349	200	0	415
Netherlands	0	164	104	213	2	713	1,048	2,584	848	4,855
Mexico	...	...	...	...	(3) 0	(3) 0	(3) 25	(3) 27	0	146
Burma	...	...	1	0	—	—	3	2	—	4
Ceylon	...	...	2	1	—	—	5	2	—	11
Chosen	...	...	...	...	(1) 0	(1) 0	(1) 0	(1) 0	0	2
Indochina	...	...	...	...	(1) 0	(1) 0	(1) 0	(1) 0	0	1
Japan	...	...	...	...	—	—	(1) 0	(1) 0	—	0
Palestine	...	...	...	...	(1) 0	(1) 6	(1) 19	(1) 157	6	304
New Zealand	...	...	...	...	(2) 0	(2) 0	(2) 71	(2) 8	0	197

(1) Up to December 31. — (2) Up to November 30. — (3) Up to October 31 — (4) Up to September 30.

COUNTRIES	JANUARY				SIX MONTHS (August 1-January 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Oats. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Bulgaria	0	0	0	0	0	0	0	0	0	0
Hungary	0	0	0	0	0	0	0	0	0	0
Romania	0	0	0	0	0	0	0	0	0	0
Yugoslavia . . . . .	...	...	...	...	(1)	(1)	0	(1)	0	0
Canada . . . . .	...	...	...	...	(1)	2,253	(1)	1,399	...	3,265
United States	3	94	191	25	19	1,153	1,138	26	1,193	1,134
Argentina	1,089	495	—	—	4,867	2,458	—	—	5,957	427
Chile . . . . .	...	...	...	...	(3)	185	(3)	121	(3)	0
Chosen . . . . .	...	...	...	...	(1)	0	(1)	0	(1)	0
India, by sea	0	2	—	—	7	12	—	—	21	—
Turkey	0	0	—	—	6	127	—	—	231	—
Union of South Africa . . . . .	...	...	...	...	(1)	4	(1)	2	(1)	0
New Zealand . . . . .	...	...	...	...	(2)	0	(2)	0	(2)	2
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U. . . . .	...	68	...	...	(1)	0	(1)	1	(1)	119
Denmark	11	0	26	0	12	147	26	99	184	101
Greece	0	0	0	0	0	0	165	0	0	0
Norway	0	78	0	0	0	0	49	0	0	2
Netherlands	0	...	24	27	0	185	510	431	379	1,221
Mexico . . . . .	...	—	...	...	(3)	0	(3)	2	(3)	17
Peru	—	—	—	—	—	—	(2)	9	(2)	11
Ceylon	—	...	0	1	—	—	7	8	—	17
Indochina	—	—	—	—	(1)	0	(1)	0	(1)	0
Egypt	—	—	—	—	—	—	(1)	0	(1)	0

Maize. — Thousand centals (1 cental = 100 lb.).

COUNTRIES	JANUARY				THREE MONTHS (November 1-January 31)				TWELVE MONTHS (Nov. 1-Oct. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Maize. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Bulgaria	34	0	0	0	45	0	0	0	22	0
Hungary	0	135	58	0	0	136	58	0	1,038	0
Romania	961	986	0	0	2,701	3,579	0	0	12,014	0
Yugoslavia . . . . .	...	...	...	...	(1)	2	(1)	289	(1)	0
United States	2,935	3,927	18	21	6,566	9,355	84	66	19,673	253
Italy . . . . .	...	...	...	...	(1)	0	(1)	1	...	8
Dominican Republic . . . . .	...	...	...	...	(1)	47	(1)	69	...	340
Argentina	4,290	3,706	—	—	12,149	16,194	—	—	74,809	—
Brazil . . . . .	...	...	...	...	(2)	69	(2)	126	...	1,658
Burma	4	15	—	—	12	28	—	—	397	—
China . . . . .	...	...	...	...	(1)	0	(1)	19	...	26
India, by sea	0	0	—	—	0	1	—	—	1	—
Netherlands Indies:										
Java and Madura . . . . .	...	...	...	...	(1)	4	(1)	66	...	1,353
Outer Provinces . . . . .	...	...	...	...	(1)	4	(1)	52	...	813
Indochina . . . . .	...	...	...	...	(1)	2,762	(1)	2,880	...	10,037
Manchukuo . . . . .	...	...	...	...	...	...	...	...	(4)	6,311
Egypt . . . . .	...	...	...	...	(1)	0	(1)	1	(1)	0
Union of South Africa . . . . .	...	...	...	...	(1)	2,864	(1)	1,229	(1)	0
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U. . . . .	...	...	...	...	(1)	0	(1)	89	(1)	2,403
Denmark	0	0	267	209	0	0	703	360	345	12,188
Greece	0	0	120	112	0	0	134	357	1	2,855
Norway	0	0	55	374	0	0	779	788	0	1,336
Netherlands	0	0	1,019	1,474	0	0	4,253	4,602	2	2,647
Portugal . . . . .	...	...	...	...	(1)	0	(1)	44	(1)	296
Mexico . . . . .	...	...	...	...	...	...	...	...	0	864
Peru . . . . .	...	...	...	...	(2)	0	(2)	...	(2)	0
Chosen . . . . .	...	...	...	...	(1)	1	(1)	4	(1)	50
Japan	—	—	—	—	—	—	(1)	1,128	(1)	950
Palestine . . . . .	...	...	...	...	(1)	0	(1)	22	(1)	30
New Zealand . . . . .	...	...	...	...	(2)	0	(2)	0	(2)	0

(1) Up to December 31. — (2) Up to November 30. — (3) Up to October 31. — (4) Up to September 30.

COUNTRIES	JANUARY				TWELVE MONTHS (January 1-December 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939	1938	1939	1938	1938	1938
Rice. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
United States . . .	251	311	20	47	3,093	3,254	711	581	—	—
Mexico . . .	—	—	—	—	(2) 49	(2) 142	(2) 0	(2) 0	142	16
Brazil . . .	—	—	—	—	(1) 1,231	(1) 1,156	—	—	1,236	—
Burma . . .	4,906	6,067	1	3	75,481	63,090	26	27	—	—
Chosen . . .	—	—	—	—	2,220	1,040	0	0	—	—
Taiwan . . .	—	—	—	—	(2) 284	(2) 217	(2) 0	(2) 0	223	0
Indochina . . .	—	—	—	—	35,273	22,309	197	263	—	—
Iran . . .	—	—	—	—	0	795	18	12	—	—
Thailand (Siam) . . .	—	—	—	—	41,010	32,151	—	—	—	—
Egypt . . .	—	—	—	—	2,579	1,442	2	202	—	—
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U. . .	—	—	—	—	365	328	1,780	1,565	—	—
Denmark . . .	0	0	55	17	1	2	197	309	—	—
Greece . . .	0	0	63	54	0	0	647	625	—	—
Hungary . . .	0	0	90	65	0	0	584	238	—	—
Norway . . .	1	1	40	7	6	0	160	100	—	—
Netherlands . . .	1	125	97	167	1,608	2,059	5,160	3,800	—	—
Portugal . . .	—	—	—	—	0	1	104	69	—	69
Romania . . .	—	—	63	36	—	—	360	520	—	—
Yugoslavia . . .	—	—	—	—	0	0	394	490	—	—
Haiti . . .	—	—	—	—	—	—	11	10	—	—
Argentina . . .	—	—	—	—	2	1	679	1,108	—	—
Chile . . .	—	—	—	—	—	—	(2) 183	(2) 218	—	271
Peru . . .	—	—	—	—	(1) 2	(1) 0	(1) 391	(1) 691	0	714
Ceylon . . .	1	0	1,559	4,078	3	2	13,391	11,922	—	—
China . . .	—	—	—	—	156	10	7,060	8,953	—	—
India by sea . . .	386	407	3,187	2,669	6,343	6,015	51,294	24,296	—	—
: by land . . .	—	—	—	—	(3) 337	(3) 351	(3) 1,381	(3) 1,381	469	1,787
Netherlands Indies:										
Java and Madura . . .	—	—	—	—	259	186	729	89	—	—
Outer Provinces . . .	—	—	—	—	214	186	(1) 5,146	(1) 6,141	—	6,845
Japan . . .	—	—	—	—	444	184	965	500	—	—
British Malaya . . .	—	—	—	—	3,723	4,562	19,640	18,662	—	—
Manchukuo . . .	—	—	—	—	(3) 4	(3) 301	(3) 1,546	(3) 814	305	1,277
Palestine . . .	—	—	—	—	85	119	562	495	—	—
Union of Sout Afr. . .	—	—	—	—	0	0	1,748	1,311	—	—
New Zealand . . .	—	—	—	—	(1) 0	(1) 0	(1) 81	(1) 61	0	64
Linseed. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Romania . . .	0	0	0	0	3	0	2	5	—	—
Argentina . . .	3,451	3,614	—	—	26,082	27,891	—	—	—	—
Uruguay . . .	—	—	—	—	2,403	1,595	—	—	—	—
China . . .	—	—	—	—	99	160	—	—	—	—
India by sea . . .	206	510	0	0	5,934	6,424	—	—	—	—
: by land . . .	—	—	—	—	—	—	(3) 169	(3) 257	—	326
Manchukuo . . .	—	—	—	—	(3) 65	(3) 11	—	—	18	—
Egypt . . .	—	—	—	—	2	4	1	6	—	0
New Zealand . . .	—	—	—	—	(1) 2	(1) 0	(1) 0	(1) 0	0	—
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U. . .	—	—	—	—	97	93	2,349	1,886	—	—
Denmark . . .	0	—	101	41	0	1	589	372	—	—
Greece . . .	0	0	0	4	0	0	71	75	—	—
Hungary . . .	0	0	2	0	0	0	34	65	—	—
Norway . . .	0	0	84	45	0	0	513	463	—	—
Netherlands . . .	16	24	340	530	142	124	6,833	6,572	—	—
Portugal . . .	—	—	—	—	—	—	161	152	—	—
Yugoslavia . . .	—	—	—	—	0	0	159	216	—	—
Canada . . .	—	—	—	—	10	7	(4) 335	(4) 243	—	399
United States . . .	—	—	593	1,182	—	—	8,976	8,604	—	—
Burma . . .	0	0	0	0	0	0	0	0	—	—
Japan . . .	—	—	—	—	0	2	52	177	—	—
Palestine . . .	—	—	—	—	—	—	24	14	—	—

(1) Up to November 30. — (2) Up to October 31. — (3) Up to September 30. — (4) Up to July 31.

COUNTRIES	JANUARY				SIX MONTHS (August 1-January 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Cotton. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
United States . . .	5,429	1,516	44	61	22,048	11,598	330	387	17,562	749
Haiti . . .	...	...	...	...	(1) 0	(1) 2	...	...	104	...
Mexico . . .	...	...	...	...	(3) 32	(3) 164	(3) 5	(3) 1	308	9
Dominican Republic . . .	...	...	...	...	(1) 0	(1) 0	...	...	5	...
Argentina . . .	69	0	...	...	...	270	329	...	555	...
Brazil . . .	...	...	...	...	(2) 1,791	(2) 2,057	...	...	7,692	...
Peru . . .	...	...	...	...	(2) 720	(2) 804	...	...	1,801	...
Burma . . .	75	33	0	0	...	251	180	0	385	0
China . . .	...	...	...	...	(1) 48	(1) 1,148	(1) 1,988	(1) 225	1,305	3,698
India: by sea . . .	982	1,107	174	116	4,350	5,018	912	724	12,897	1,685
N. I.: Java & Mad. . .	...	...	...	...	(1) 2	(1) 5	...	...	19	...
Outer provinces . . .	...	...	...	...	(1) 12	(1) 7	...	...	19	...
Iran . . .	...	...	...	...	(1) 146	(1) 59	(1) 0	(1) 0	223	0
Turkey . . .	6	6	...	...	...	31	264	...	385	...
Egypt . . .	...	...	...	...	(1) 3,884	(1) 3,282	...	...	8,429	...
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U. . .	0	0	2	20	(1) 109	(1) 356	(1) 785	(1) 1,037	906	2,335
Bulgaria . . .	...	...	13	22	...	0	35	136	0	294
Denmark . . .	...	...	2	2	...	0	90	100	...	202
Greece . . .	0	0	75	67	...	0	26	18	0	49
Hungary . . .	0	0	20	9	...	0	296	330	0	629
Norway . . .	0	0	112	122	...	0	63	54	0	88
Netherlands . . .	0	2	...	...	2	8	752	638	12	1,203
Portugal . . .	...	...	...	...	...	...	(1) 210	(1) 261	...	474
Romania . . .	0	0	35	38	...	0	122	262	0	433
Yugoslavia . . .	...	...	...	...	(1) 0	(1) 0	(1) 147	(1) 246	0	515
Ceylon . . .	0	0	0	1	...	0	15	8	...	1,269
Chosen . . .	...	...	...	...	(1) 0	(1) 0	(1) 127	(1) 141	0	17
Indochina . . .	...	...	...	...	(1) 3	(1) 3	(1) 52	(1) 30	5	601
Japan . . .	...	...	...	...	(1) 0	(1) 1	5,749	(1) 5,573	1	13,176
Manchukuo . . .	...	...	...	...	(4) 0	(4) 0	(4) 57	(4) 146	0	682
Palestine . . .	...	...	...	...	(1) 1	(1) 0	(1) 10	(1) 5	0	16
Union of South Afr. . .	...	...	...	...	(2) 0	(2) 3	(2) 6	(2) 5	3	13
Wool. — Thousand lb.										
FIVE MONTHS (September 1-January 31)										
<i>Exporting Countries:</i>										
Argentina . . . { (a)	31,857	41,471	—	—	90,877	129,171	—	—	299,153	—
(b)	6,349	4,502	—	—	28,074	24,200	—	—	56,747	—
Chile . . .	...	...	...	...	(3) 201	(3) 273	(3) 35	(3) 181	30,838	461
Peru . . .	...	...	...	...	(2) 3,682	(2) 2,672	...	...	12,022	...
Uruguay . . . { (a)	...	...	...	...	(1) 19,941	(1) 31,943	...	...	95,932	...
(b)	...	...	...	...	(1) 4,941	(1) 6,570	...	...	24,306	...
Burma . . .	18	22	0	0	...	99	106	...	311	...
China . . .	...	...	...	...	(1) 320	(1) 4,187	...	...	6,671	...
India by sea . . .	7,072	4,696	763	772	28,127	34,681	2,088	2,771	76,997	8,031
by land . . .	...	...	...	...	...	...	(4) 1,684	(4) 1,153	20,097	...
Iran . . .	...	...	...	...	(1) 4,828	(1) 714	(1) 0	(1) 0	6,151	0
Manchukuo . . .	...	...	...	...	(4) 13	(4) 322	(4) 0	(4) 0	3,567	295
Palestine . . .	...	...	...	...	(1) 33	(1) 44	(1) 4	(1) 11	18	40
Turkey . . . (a)	304	280	—	—	4,636	9,566	...	...	21,272	...
Egypt . . .	...	...	...	...	(1) 1,493	(1) 1,614	(1) 49	(1) 157	5,176	465
Un of S. Africa. { (a)	...	...	...	...	(1) 48,120	(1) 102,207	(2) 13	(2) 425	234,846	1,058
(b)	...	...	...	...	(1) 2,853	(1) 1,916	(2) 143	(2) 368	7,994	1,587
New Zealand . . . { (a)	...	...	...	...	(1) 4,971	(1) 33,069	(2) 0	(2) 20	254,591	55
(b)	...	...	...	...	(1) 3,746	(1) 10,150	(2) 0	(2) 4	57,270	4
<i>Importing Countries:</i>										
Belgo-Luxemb. { (a)	...	...	...	...	(1) 5,895	(1) 15,271	(1) 5,878	(1) 55,228	57,576	220,450
Union Un. { (b)	...	...	...	...	(1) 9,348	(1) 10,920	(1) 626	(1) 1,671	32,659	7,496
Bulgaria . . .	0	0	12	104	...	0	220	487	0	1,757
Denmark . . .	73	20	375	216	...	170	130	1,131	384	4,608
Greece . . .	64	55	88	703	...	670	1,131	2,403	2,103	7,657
Hungary . . .	0	130	44	410	...	0	280	670	1,027	3,208
Norway . . .	148	137	170	212	...	461	732	818	1,689	2,668
Netherlands . . . { (a)	...	...	1,958	871	...	126	483	5,485	3,759	11,572
(b)	29	22	450	895	...	37	121	4,938	756	12,225
Portugal . . .	...	...	...	...	(1) 2,035	(1) 393	(1) 580	(1) 1,074	2,251	3,318
Romania . . .	...	...	...	...	...	0	18	73	62	840
Yugoslavia . . .	0	0	0	62	...	0	(1) 220	(1) 1,082	433	11,475
United States . . .	...	...	...	...	(1) 0	(1) 265	(1) 143,484	(1) 84,060	419	209,678
Mexico . . .	4	7	45,082	21,940	...	0	(3) 884	(3) 626	139	4,837
Japan . . .	...	...	...	...	(1) 0	(1) 0	(1) 26,469	(1) 29,716	0	107,551

(a) Unwashed wool. — (b) Washed wool. — (1) Up to December 31. — (2) Up to November 30. — (3) Up to October 31
 — (4) Up to September 30.

COUNTRIES	JANUARY				TWELVE MONTHS (January 1-December 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939	1938	1939	1938	1938	1938
Butter. — Thousand lb.										
<i>Exporting Countries</i>										
Bulgaria	0	4	0	0	11	53	0	0	—	—
Denmark	23,967	22,007	0	0	330,267	348,459	2	0	—	—
Hungary	40	395	0	0	3,305	7,760	0	0	—	—
Norway	0	42	0	0	126	1,797	0	0	—	—
Netherlands	10,265	7,238	0	0	124,416	112,141	0	7	—	—
Romania	64	22	0	0	924	256	0	0	—	—
Yugoslavia	—	—	—	—	260	196	—	—	—	—
Argentina	5,212	1,870	0	0	19,745	16,173	0	0	—	—
Union of South Afr	—	—	—	—	6,929	3,536	24	2	—	—
New Zealand	—	—	—	—	274,263	293,233	(1)	2 (1)	9	9
<i>Importing Countries</i>										
Belgo-Luxemb E U	—	—	22	121	26	51	2,081	2,540	—	—
Greece	—	—	—	—	—	—	1,074	1,151	—	—
Portugal	—	—	—	—	157	115	0	0	—	—
United States	229	126	66	99	2,308	1,960	1,107	1,618	—	—
Mexico	—	—	—	—	—	—	(2)	(2)	—	174
Peru	—	—	—	—	(1)	0 (1)	194 (1)	293 (1)	194	355
Burma	—	—	57	79	—	—	719	668	—	—
Ceylon	—	—	37	95	—	—	1,109	858	—	—
China	—	—	—	—	—	—	593	531	—	—
India: by sea	562	509	99	110	5,785	6,116	1,065	968	—	—
by land	—	—	—	—	—	—	(3)	(3)	—	5,908
Netherlands Indies	—	—	—	—	—	—	6,698	7,335	—	—
Java and Madura	—	—	—	—	—	—	(1)	(1)	—	2,568
Outer Provinces	—	—	—	—	—	—	2,238	2,266	—	—
Indochina	—	—	—	—	4	2	2,037	620	—	—
Iran	—	—	—	—	4	20	185	0	—	—
British Malaya	—	—	—	—	657	650	5,161	4,691	—	—
Palestine	—	—	—	—	—	7	4,389	4,493	—	—
Egypt	—	—	—	—	265	335	871	1,325	—	—
Cheese. — Thousand lb.										
<i>Exporting Countries</i>										
Bulgaria	236	150	0	0	1,389	3,660	0	2	—	—
Denmark	1,836	1,590	2	2	21,140	20,082	22	20	—	—
Hungary	4	7	2	0	741	787	2	2	—	—
Norway	280	260	37	44	3,966	3,642	648	518	—	—
Netherlands	9,332	9,176	53	40	114,531	128,953	615	692	—	—
Romania	7	2	9	9	353	110	64	73	—	—
Yugoslavia	—	—	—	—	3,803	3,384	40	46	—	—
Argentina	317	324	—	—	5,474	4,363	84	108	—	—
Union of South Afr	—	—	—	—	4,253	2,716	282	362	—	—
New Zealand	—	—	—	—	187,259	180,381	(1)	2 (1)	9	9
<i>Importing Countries</i>										
Belgo-Luxemb E U	—	—	—	—	236	280	52,016	53,350	—	—
Greece	13	2	7	187	95	172	2,198	1,534	—	—
Portugal	—	—	—	—	216	154	201	245	—	—
United States	108	104	3,338	3,913	1,479	1,482	59,075	54,432	—	—
Mexico	—	—	—	—	(2)	7 (2)	4 (2)	783 (2)	769	7
Chile	—	—	—	—	(2)	7 (2)	11 (2)	75 (2)	64	1,010
Peru	—	—	—	—	(1)	2 (1)	0 (1)	664 (1)	765	816
Burma	—	—	2	15	—	—	97	90	—	—
Ceylon	—	—	35	9	—	—	194	243	—	—
India: by sea	0	0	185	101	4	2	992	1,164	—	—
Netherlands Indies	—	—	—	—	—	—	—	—	—	—
Java and Madura	—	—	—	—	—	—	2,011	2,035	—	—
Indochina	—	—	—	—	2	2	520	578	—	—
British Malaya	—	—	—	—	33	33	419	392	—	—
Palestine	—	—	—	—	20	35	2,072	2,112	—	—
Egypt	—	—	—	—	64	90	5,315	7,478	—	—

(1) Up to November 30 — (2) Up to October 31. — (3) Up to September 30.

COUNTRIES	JANUARY				FOUR MONTHS (October 1 January 31)				TWELVE MONTHS (Oct 1 Sept 30)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939 40	1938 39	1939 40	1938 39	1938 39	1938 39
Cacao. — Thousand lb										
<i>Exporting Countries</i>										
Haiti			—	—	(1) 1 475	(1) 1 788	—	—	3 979	—
Dominican Republic			—	—	(1) 5 858	(1) 7 659	—	—	63 690	—
Brazil			—	—	(1) 53 548	(2) 50 546	—	—	303 317	—
Ecuador			—	—	(1) 3 395	(1) 7 804	—	—	36 174	—
Trinidad			—	—	(1) 3 001	(1) 4 156	—	—	17 921	—
Ceylon	1 691	891	—	—	(1) 4 356	2 875	—	—	7 754	—
Java and Madura			—	—	(1) 666	(1) 906	—	—	3 098	—
Belgian Congo			—	—	(1) 412	(2) 289	—	—	2 806	—
Gold Coast	71 218	91 560	—	—	188 520	233 933	—	—	643 415	—
Nigeria & Cameroons			—	—	(1) 43 257	(1) 47 363	—	—	259 104	—
Sao Thomé and Príncipe			—	—	(1) 5 833	(1) 8 830	—	—	23 202	—
<i>Importing Countries</i>										
Belgo-Luxemb F U	—	—	223	291	(1) 0	(1) 0	(1) 11 698	(1) 6 288	168	26 678
Bulgaria	—	—	351	1 825	—	—	445	899	—	2 121
Denmark	0	0	0	198	0	0	5 174	4 021	7	11 133
Greece	0	0	0	198	2	0	366	1 601	0	4 101
Hungary	—	—	51	915	—	—	1 116	3 942	—	13 045
Norway	0	0	1 582	827	0	0	4 381	2 341	0	8 186
Netherlands	0	55	7 758	13 916	0	1 076	30 501	51 478	1 537	180 200
Portugal	—	—	—	—	(1) 2	(1) 0	(1) 498	(1) 353	2	1 215
Romania	—	—	388	375	—	—	1 561	814	—	3 783
Yugoslavia	—	—	—	—	—	—	(1) 430	(1) 840	—	3 157
United States	—	—	51 412	40 642	—	—	214 067	123 373	—	583 184
Argentina	—	—	—	—	—	—	(1) 2 734	(1) 2 233	—	10 966
Uruguay	—	—	—	—	—	—	(1) 340	(1) 381	—	1 334
Pakistan	—	—	—	—	—	—	(1) 112	(1) 150	—	1 451
Egypt	—	—	—	—	—	—	(1) 331	(1) 445	—	639
Union of South Africa	—	—	—	—	—	—	(1) 209	(1) 738	—	2 377
New Zealand	—	—	—	—	—	—	(1) 209	(1) 318	—	4 191

Coffee. — Thousand lb

COUNTRIES	JANUARY				FOUR MONTHS (July 1 January 31)				TWELVE MONTHS (July 1 June 30)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939 40	1938 39	1939 40	1938 39	1938 39	1938 39
Coffee. — Thousand lb										
<i>Exporting Countries</i>										
Costa Rica	10 770	15 007	—	—	(1) 5 124	(1) 4 458	—	—	45 429	—
Guatemala	—	—	—	—	37 474	42 479	—	—	98 040	—
Haiti	—	—	—	—	(1) 22 029	(1) 24 932	—	—	64 854	—
Jamaica	—	—	—	—	(1) 7 769	(1) 4 226	—	—	9 808	—
Mexico	—	—	—	—	(1) 8 979	(1) 8 117	—	—	79 766	—
Dominican Republic	—	—	—	—	(1) 8 553	(1) 7 700	—	—	30 459	—
Salvador	—	—	—	—	(1) 14 564	(1) 75 944	—	—	130 792	—
Brazil	146 072	154 919	—	—	1 286 571	1 268 032	—	—	2 155 720	—
Columbia	44 657	41 903	—	—	82 041	322 870	—	—	537 319	—
Netherlands Guiana	—	—	—	—	(1) 3 351	(1) 2 722	—	—	5 404	—
Peru	—	—	—	—	(1) 4 436	(1) 111	(1) 0	(1) 2	6 546	4
Venezuela	—	—	—	—	(1) 14 795	(1) 24 934	—	—	69 737	—
Albania by sea	—	—	—	—	(1) 6 711	(1) 5 629	—	—	11 380	—
British by sea	1 195	3 060	0	0	5 966	6 166	0	2	23 153	7
N. I. Java & Mad.	—	—	—	—	(1) 33 594	(1) 29 480	—	—	55 202	—
Outer Provinces	—	—	—	—	(1) 47 519	(1) 67 285	—	—	106 993	—
Indochina	—	—	—	—	(1) 1 043	(1) 514	(1) 31	(1) 46	1 459	106
French Congo	—	—	—	—	(1) 16 094	(1) 19 524	—	—	45 299	—
Kenya	—	—	—	—	(1) 10 472	(1) 8 591	—	—	38 142	—
Cameroon	—	—	—	—	(1) 17 452	(1) 14 416	—	—	35 084	—
Angola	—	—	—	—	(1) 7 217	(1) 19 559	—	—	30 622	—
<i>Importing Countries</i>										
Belgo-Luxemb F U	—	—	99	146	(1) 258	(1) 3 583	(1) 59 084	(1) 56 370	4 017	118 025
Bulgaria	—	—	6 116	13 711	—	—	624	736	—	1 279
Denmark	2	2	985	785	176	4	56 425	54 776	115	82 048
Greece	—	—	55	183	—	—	6 259	8 638	—	13 018
Hungary	—	—	4 705	2 339	—	—	2 180	2 610	—	5 590
Norway	0	2	5 031	9 797	7	75	27 734	22 929	104	44 174
Netherlands	247	1 179	—	—	4 023	9 266	54 357	72 576	16 339	113 585
Portugal	—	—	220	842	(1) 1 554	(1) 825	(1) 9 304	(1) 4 389	1 903	13 716
Romania	—	—	—	—	—	—	3 135	—	8 025	—
Yugoslavia	—	—	—	—	—	—	(1) 7 862	(1) 7 884	0	15 839
United States	897	1 327	161 694	187 854	7 333	5 205	1 184 314	1 162 120	10 598	1 965 955
Argentina	—	—	—	—	—	—	(1) 32 979	(1) 28 570	—	30 892
Chile	—	—	—	—	—	—	(1) 3 982	(1) 2 734	—	6 967
Uruguay	—	—	—	—	—	—	(1) 2 487	(1) 2 954	—	5 540
Ceylon	24	11	35	33	384	18	161	197	269	302
Burma	2	0	86	344	4	0	2 103	1 949	2	3 170
Japan	—	—	—	—	(1) 20	(1) 247	(1) 1 175	(1) 4 456	376	6 279
British Malaya	—	—	—	—	(1) 5 170	(1) 3 168	(1) 12 189	(1) 9 462	7 297	21 030
Pakistan	—	—	—	—	(1) 4	(1) 0	(1) 1 296	(1) 1 237	0	3 624
Turkey	—	—	906	836	—	—	7 225	6 303	—	12 260
Egypt	—	—	—	—	—	—	(1) 7 787	(1) 5 875	—	12 081
Union of South Africa	—	—	—	—	(1) 240	(1) 11	(1) 23 755	(1) 18 583	24	33 193
New Zealand	—	—	—	—	(1) 0	(1) 229	(1) 271	(1) 271	0	569

COUNTRIES	JANUARY				SEVEN MONTHS (July 1-January 31)				TWELVE MONTHS (July 1-June 30)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Tea. — Thousand lb.										
<i>Exporting Countries:</i>										
Ceylon	17,891	16,076	0	0	123,131	124,401	0	0	231,627	0
China . . . . .	...	...	...	...	(1) 29,875	(1) 63,511	(1) 7,304	(1) 1,942	83,388	7,015
Taiwan . . . . .	...	...	...	...	(3) 8,166	(3) 11,486	(3) 0	(3) 0	20,435	0
India: by sea	35,459	21,769	95	381	284,565	286,822	948	2,617	332,784	4,736
" : by land . . . . .	...	...	...	...	(4) 2,266	(4) 3,503	...	...	13,618	...
N I: Java & Mad. . . . .	...	...	...	...	(1) 62,808	(1) 60,804	(1) 223	(1) 306	127,258	483
Outer Provinces . . . . .	...	...	...	...	(1) 16,378	(1) 16,226	...	...	32,428	...
Indochina . . . . .	...	...	...	...	(1) 3,366	(1) 2,709	(1) 249	(1) 637	4,738	944
Japan . . . . .	...	...	...	...	(1) 34,491	(1) 23,129	(1) 73	(1) 86	35,023	130
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U. . . . .	...	...	...	...	(1) 7	(1) 0	(1) 364	(1) 302	2	664
Bulgaria . . . . .	...	...	2	7	...	...	31	49	...	60
Denmark	2	0	293	101	2	2	1,230	946	2	1,561
Greece . . . . .	...	...	9	66	...	...	190	295	...	414
Hungary . . . . .	...	...	4	31	...	...	181	368	...	677
Norway	0	0	88	22	0	0	328	223	0	397
Netherlands	11	15	2,590	2,346	68	108	21,478	17,123	201	35,448
Portugal . . . . .	...	...	...	...	...	...	(1) 181	(1) 176	...	317
Romania . . . . .	...	...	22	106	...	...	511	465	...	800
Yugoslavia . . . . .	...	...	...	...	...	...	(1) 172	(1) 289	...	485
United States . . . . .	...	...	11,927	7,699	...	...	(1) 63,092	(1) 50,718	...	89,601
Argentina . . . . .	...	...	...	...	...	...	(1) 2,465	(1) 2,701	...	4,802
Chile . . . . .	...	...	...	...	...	...	(3) 2,044	(3) 2,116	...	6,792
Peru . . . . .	...	...	...	...	...	...	(2) 412	(2) 494	...	1,074
Uruguay . . . . .	...	...	...	...	...	...	(1) 203	(1) 269	...	450
Burma	51	4	273	366	538	128	1,400	761	163	2,255
Iran . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 7,716	(1) 8,300	0	17,785
British Malaya . . . . .	...	...	...	...	(1) 666	(1) 664	(1) 2,624	(1) 2,661	1,495	5,060
Mandchukuo . . . . .	...	...	...	...	(4) 6,352	(4) 6,704	...	...	...	17,655
Palestine . . . . .	...	...	...	...	(1) 7	(1) 0	(1) 328	(1) 291	0	675
Turkey . . . . .	...	...	0	223	...	...	1,030	1,210	...	2,174
Egypt . . . . .	...	...	...	...	...	...	(1) 7,372	(1) 8,331	...	16,535
Union of South Afr. . . . .	...	...	...	...	(2) 205	(2) 168	(1) 10,609	(1) 8,655	659	16,865
New Zealand . . . . .	...	...	...	...	(2) 66	(2) 82	(2) 4,431	(2) 4,694	165	11,407
Total Wheat and Flour †. — Thousand centals (1 cental = 100 lb.).										
COUNTRIES	JANUARY				SIX MONTHS (August 31-January 31)				TWELVE MONTHS (August 1-July 31)	
	NET EXPORTS (*)	NET IMPORTS (**)	NET EXPORTS (*)	NET IMPORTS (**)	NET EXPORTS (*)	NET IMPORTS (**)	NET EXPORTS (*)	NET IMPORTS (**)	N. EX. (*)	N. IMP. (**)
Belgo-Luxemb. E. U. . . . .	...	...	...	...	...	...	(1) 11,524	(1) 9,620	...	22,599
Bulgaria	457	0	...	...	2,224	3	...	...	2,101	...
Denmark . . . . .	...	...	228	325	...	...	1,427	1,890	...	3,000
Greece . . . . .	...	...	360	364	...	...	3,393	3,100	...	7,797
Hungary	1,221	874	...	...	16,263	9,228	...	...	17,685	...
Norway . . . . .	...	...	812	179	...	...	4,854	2,581	...	5,087
Netherlands . . . . .	...	...	1,146	1,139	...	...	8,289	8,943	...	18,034
Portugal . . . . .	...	...	...	...	...	...	(1) 237	(1) 1,189	...	1,345
Romania	1,676	2,583	...	...	11,675	14,966	...	...	27,574	...
Yugoslavia . . . . .	...	...	...	...	(1) 3,932	(1) 2,447	...	...	3,276	...
Canada	8,110	5,622	...	...	73,893	58,838	...	...	98,650	...
United States	937	6,949	...	...	13,299	26,170	...	...	58,400	...
Haiti . . . . .	...	...	...	...	...	...	...	...	...	236
Mexico . . . . .	...	...	...	...	...	...	(3) 14	(3) 47	...	1,246
Argentina	7,893	5,915	...	...	55,463	19,156	...	...	72,706	...
Brazil . . . . .	...	...	...	...	...	...	(2) 6,621	(2) 8,025	...	24,236
Chile . . . . .	...	...	...	...	...	...	(3) 26	(3) 21	...	126
Peru . . . . .	...	...	...	...	...	...	(2) 1,198	(2) 922	...	2,681
Uruguay . . . . .	...	...	...	...	(1) 1,380	(1) 798	...	...	2,948	...
Burma . . . . .	...	...	121	114	...	...	...	...	...	1,212
Ceylon . . . . .	...	...	51	35	...	...	...	...	...	579
China . . . . .	...	...	...	...	...	...	(1) 3,982	(1) 2,720	...	11,996
Chosen . . . . .	...	...	...	...	(1) 164	(1) 368	...	...	612	...
Taiwan . . . . .	...	...	...	...	...	...	(3) 0	(3) 0	...	3
India: by sea	21	...	...	535	683	551	...	...	...	881
" : by land . . . . .	...	...	...	...	(4) 93	(4) 67	...	...	311	...
N I: Java & Mad. . . . .	...	...	...	...	...	...	(1) 876	(1) 772	...	1,695
Outer Provinces . . . . .	...	...	...	...	...	...	(2) 420	(2) 334	...	994
Indochina . . . . .	...	...	...	...	...	...	(1) 156	(1) 370	...	960
Iran . . . . .	...	...	...	...	...	...	(1) 0	(1) 0	...	0
Japan . . . . .	...	...	...	...	(1) 3,275	(1) 3,432	...	...	5,445	...
British Malaya . . . . .	...	...	...	...	...	...	(1) 929	(1) 751	...	1,881
Mandchukuo . . . . .	...	...	...	...	...	...	(4) 3,417	(4) 1,525	...	7,472
Palestine . . . . .	...	...	...	...	...	...	(1) 716	(1) 667	...	2,345
Turkey	7	308	...	...	60	987	...	...	1,198	...
Egypt . . . . .	...	...	...	...	...	...	(1) 44	(1) 21	...	119
Union of South Afr. . . . .	...	...	...	...	...	...	(2) 106	(2) 1,025	...	2,537
New Zealand . . . . .	...	...	...	...	...	...	(2) 228	(2) 321	...	56,118

(*) Excess of exports over imports. — (**) Excess of imports over exports.

† Flour reduced to grain on the basis of the coefficient: 1,000 centals of flour = 1,333-333 centals of grain.

(1) Up to December 31. — (2) Up to November 30. — (3) Up to October 31. — (4) Up to September 30.

STOCKS**Commercial cereals in store in Canada and the United States.**

PRODUCTS AND LOCATION	Friday or Saturday nearest 1st of month ⁽¹⁾				
	March 1940	February 1940	January 1940	March 1939	March 1938
	thousand cents				
WHEAT:					
Canadian in Canada	175,254	180,860	186,513	85,827	27,250
U.S. in Canada	487	487	488	91	679
U.S. in the United States	66,457	71,401	79,705	57,284	38,429
Canadian in the United States	16,665	20,551	23,270	2,167	1,168
TOTAL	258,863	273,299	289,976	145,369	67,526
RYE:					
Canadian in Canada	1,644	1,514	1,359	1,180	715
U.S. in Canada	13	13	13	13	330
U.S. in the United States	5,667	5,719	5,902	4,277	2,088
Canadian in the United States	506	506	409	24	0
TOTAL	7,830	7,752	7,683	5,494	3,133
BARLEY:					
Canadian in Canada	3,761	3,504	3,485	3,026	4,346
U.S. in Canada	1	2	2	0	0
U.S. in the United States	7,718	8,320	8,935	5,628	5,339
Canadian in the United States	741	1,003	1,141	0	74
TOTAL	12,221	12,829	13,563	8,654	9,759
OATS:					
Canadian in Canada	4,022	3,494	3,484	2,939	3,279
U.S. in Canada	46	54	60	130	691
U.S. in the United States	2,517	2,873	3,857	4,688	7,486
Canadian in the United States	250	313	428	0	0
TOTAL	6,835	6,734	7,829	7,757	11,456
MAIZE:					
U.S. in Canada	688	907	1,656	2,112	262
Argentine in Canada . . . . .	..	0	1	16	98
South African in Canada . . . . .	..	669	802	238	1,252
Australian in Canada . . . . .	..	0	0	99	0
U.S. in the United States	22,722	23,692	25,677	26,594	22,509
Of other origin in the United States	0	0	0	0	0
TOTAL . . . . .	..	25,268	28,136	29,059	24,121

(1) Friday for Canada, Saturday for the United States.

Commercial cereals ⁽¹⁾ and oilseeds in store in Argentina.

PRODUCTS AND LOCATION	First day of month				
	February 1940	January 1940	December 1939	February 1939	February 1938
	thousand cents				
Rye	3,852	1,045	966	1,289	265
Barley	6,742	1,934	475	3,570	2,959
Oats	5,833	3,522	1,679	5,636	5,768
Maize in the ports	5,802	8,233	7,572	2,011	337
Maize in other positions	2,641	4,628	6,788	3,349	1,229
TOTAL	8,443	12,861	14,360	5,360	1,566
Canaryseed	458	237	239	279	236
Linseed in the ports	2,709	1,464	437	4,331	2,752
Linseed in other positions	4,230	2,233	441	6,614	6,988
TOTAL	6,939	3,697	878	10,945	9,740
Sunflowerseed	64	292	434	322	—

⁽¹⁾ Figures for wheat in store have been withheld by governmental order.

Wheat and wheat-flour in the Union of South Africa.

LOCATION	Last day of month				
	January 1940	December 1939	November 1939	January 1939	January 1938
	thousand centals				
Wheat held by millers					
South African	2,315	1,469	952	2,652	3,775
Imported	37	49	58	102	3
Wheat held by co-operatives	1,025	695	251	1,267	522
TOTAL	3,377	2,213	1,261	4,021	4,300
Wheat-flour and boermeal ⁽¹⁾ held by millers	262	236	266	243	156
Grand total ⁽²⁾	3,740	2,540	1,629	4,349	4,510

(1) 140 lb of wheat flour or 165 lb of boermeal correspond to 200 lb of wheat. — (2) Including flour in terms of grain.

Imported cereals in Antwerpen.

PRODUCTS AND LOCATION	Last day of month				
	February 1940	January 1940	December 1939	February 1939	February 1938
	thousand centals				
Wheat	1,174	1,922	1,531	916	1,642
Rye	128	29	4	58	45
Barley	160	214	336	122	262
Oats	0	4	0	12	15
Maize	32	365	256	124	377

Cotton stocks on hand in the United States.

LOCATION	Last day of month				
	February 1940	January 1940	December 1939	February 1939	February 1938
	thousand centals				
In consuming establishments	8,363	8,736	9,144	7,664	8,980
In public storage and at compresses	59,809	64,975	71,740	69,213	57,023
TOTAL	68,172	73,711	80,884	76,877	66,003

PRICES**PRICES BY PRODUCTS (*)**

All quotations are spot, on Fridays, unless otherwise stated. The monthly averages are based on the Friday quotations, and the yearly averages on the monthly

DESCRIPTION	March	March	March	Feb	Feb	AVERAGE			Commercial Season (*)	
	15	8	1	23	16	Feb	March	March	1938	1937
	1940	1940	1940	1940	1940	1940	1939	1938	39	38
Wheat										
Budapest Tisza wheat, 78 kg per hl (pengo per quintal)	n q	20 75	21 75	20 65	20 65	20 65	20 70	21 00	20 42	21 44
Braila Home grown good qual (lei p ql)	530	500	500	480	480	480	432	540	411	520
Winnipeg No 1 Manitoba (cents p 60 lb)	86	87 1/2	87 1/2	87	83 1/2	83 1/2	59 1/2	137 1/2	67	131 1/2
Chicago No 2 Hard Winter (cents p 60 lb)	103 1/2	105 1/2	104 1/2	110 1/2	107	105	71 1/2	94 1/2	70 1/2	96 1/2
Minneapolis (cents per 60 lb)										
No 1 Northern	99 1/2	102	100 1/2	104 1/2	102 1/2	101 1/2	74 1/2	102	74 1/2	104 1/2
No 2 Amber Durum	87	90	88 1/2	92 1/2	90 1/2	89 1/2	70	93 1/2	65 1/2	93 1/2
New York No 2 Hard Winter (f o b cents per 60 lb)	123 1/2	125 1/2	123 1/2	128 1/2	126 1/2	124 1/2	82 1/2	111	84 1/2	112 1/2
Buenos Aires (a) No 2 Hard 80 kg per hl (paper pesos per quintal)	7 45	7 40	7 25	7 15	7 20	7 25	7 00	11 47	6 89	12 20
Karachi White Karachi 2 5 barley 1 1/2 % impurities (rupees per 656 lb)	29- 6- 0	29- 8- 0	30- 4- 0	28- 14- 0	28- 12- 0	29- 2- 0	23- 12- 0	24- 7- 0	22 12- 8	26- 15- 9
Antwerpen (francs per quintal)										
Home grown	159 00	159 00	158 00	155 00	151 00	151 25	127 60	134 25	123 75	135 05
No 1 Manitoba (Atlantic c i f, arrived)*	169 00	166 00	167 00	169 00	153 00	152 00	92 00	183 85	96 25	171 20
Bahia (c i f, arrived)	165 50	161 50	164 00	165 00	150 00	148 60	73 20	134 50	79 00	142 10
London, Mark Lane English (sh per 504 lb, at farm)	31/6	31/6	31/6	31/6	31/6	31/6	18/0 1/2	34 3	20 7 1/2	37 7 1/2
London, Baltic (f o b, parcels sh per 480 lb)										
No 1 Northern Manitoba (St John)	37/7 1/2	38 -	38/-	37 10 1/2	35 10 1/2	36 1 1/2	—	—	—	—
No 1 Northern Manitoba (Pacific)	31/6	32	31 4 1/2	31 8 1/2	29 10 1/2	30 0 1/2	—	—	—	—
Argentina	n q	24 3	24 1 1/2	24 6	24 1 1/2	n q	—	—	—	—
A stralian	25/9	25 9	26/-	26 3	26 3	26 1 1/2	—	—	—	—
Rye										
Budapest Pest rye (pengo p quintal)	n q	16 42	16 42	16 12	16 12	16 12	14 29	18 84	14 34	18 57
Winnipeg No 2 rye (cents p 56 lb)		71	70 1/2	72	71 1/2	71 1/2	39 1/2	73 1/2	40 1/2	72 1/2
Minneapolis No 2 rye (cents p 56 lb)	63	66 1/2	64 1/2	68	67 1/2	66 1/2	43	67 1/2	44	67 1/2
Antwerpen (francs per quintal)										
Home grown	145 00	145 00	143 00	139 00	131 00	133 50	n q	125 50	n q	124 85
Danubian (c i f, arrived)	142 00	142 50	143 00	142 00	132 50	137 25	83 40	123 85	81 80	123 30
Soviet (c i f, arrived)	144 00	143 50	144 00	144 00	134 00	133 35	63 50	114 75	61 15	112 50
Plata (c i f, arrived)	142 50	143 00	144 00	143 50	133 00	131 75	81 10	123 75	80 80	124 55
Barley										
Braila Average quality (lei p quintal)	410	420	n q	415	415	419	356	392	338	365
Winnipeg No 4 West (cents p 48 lb) (*)			n q	50 1/2	49 1/2	49 1/2	34 1/2	58 1/2	34 1/2	56 1/2
Chicago Feeding (on sample cents p 48 lb)	45	46	45	45	45	44 1/2	37 1/2	55	40 1/2	51 1/2
Minneapolis No 2 Feeding (cents p 48 lb)	47 1/2	48	48	49	48	48 1/2	42 1/2	55 1/2	40 1/2	53 1/2
Antwerpen (c i f, arrived frs per ql)										
Danubian	139 50	140 00	141 00	141 00	132 00	132 25	75 50	107 50	75 45	106 10
No 2 Federal (*)	n q	n q	n q	n q	n q	n q	73 90	102 10	71 40	100 80
Plata, 64/65 kg per hl	140 00	142 00	144 00	145 00	135 00	133 85	73 10	108 50	74 20	106 80
London Mark Lane English malting (sh per 448 lb at farm)	69 -	72/6	70 -	70/-	72 6	71/10	35/-	48 1 1/2	36/1	53/-
London, Baltic (f o b St John, parcels, sh per 400 lb)										
No 1 Canadian Feed	n q	n q	n q	n q	n q	n q	—	—	—	—
No 3 Canadian 6 row	25 6	26 3	26 4 1/2	26 6 1/2	26 3	26 1/2	—	—	—	—
La Plata	n q	n q	15/9	16 -	15 9	16 3 1/2	—	—	—	—
No 1 Australian Chevalier (p 448 lb)	26 6	26 6	26 6	26 6	n q	n q	—	—	—	—

* Indicates that the product was not quoted during part of the period under review — n q. = not quoted — n = nominal

— (a) Thursday prices

(*) In relation to Government price fixing, numerous series are omitted from this table, notes concerning them have been given in various issues of the Crop Report. United Kingdom 1939 p 1060 Italy Dec 1933 p 1104 Germany Feb 1940 p 142, they will be continued — (1) August July — (2) As from Jan 1, 1941, No 2 Manitoba — (3) As from Sept 22, 1939 No 2 Feeding barley — (4) As from Sept 23, 1938 No 3 Federal — (5) First maximum price prices of Soviet wheat, which is not under control, are much higher — (6) Shipping Baltimore — (7) Barroso 62 lb new crop — (8) Baril 62 lb new crop — (9) Feb 9 71 1/2 — (10) Feb 3 49 1/2 Feb 2 48 1/2 — (11) Shipping March

DESCRIPTION	March	March	March	Feb.	Feb.	AVERAGE				Commercial	
	15	8	1	23	16	Feb.	March	March		Season ¹⁾	
	1940	1940	1940	1940	1940	1940	1939	1938		1938-39	1937-38
Oats.											
Winnipeg: No. 2 White (cents per 34 lb.)	...	40	39 ³ / ₄	41 ¹ / ₄	41	⁴ / ₁ 42 ¹ / ₄	28 ¹ / ₄	52		29	50 ¹ / ₄
Chicago: No. 2 White (cents per 32 lb.)	43 ¹ / ₄	45 ¹ / ₄	43 ³ / ₄	44 ¹ / ₄	44 ¹ / ₄	43 ³ / ₄	32 ¹ / ₄	33 ¹ / ₄		30 ¹ / ₄	32 ¹ / ₄
Buenos Aires (a). No. 2 White, 49 kg. per hl. (paper pesos p. quintal)	5.50	5.40	5.25	5.25	5.20	5.18	4.56	6.79		4.81	6.32
London, Mark Lane: English white (sh. per 336 lb.; at farm)	¹ / ₁ n 36/-	¹ / ₁ n 36/-	¹ / ₁ n 39/-	¹ / ₁ n 39/-	¹ / ₁ n 39/-	¹ / ₁ n 39/-	18/2 ¹ / ₄	25/9		19/3 ¹ / ₄	26/6 ¹ / ₄
London, Baltic (f.o.b. St. John, parcels; sh. per 320 lb.)											
No. 1 Canadian feeding	n. q.	n. q.	n. q.	n. q.	¹ / ₁ 16/7 ¹ / ₄	¹ / ₁ 16/7	—	—		—	—
No. 2 Canadian Western	22 3	22 11 ¹ / ₄	22/10 ¹ / ₄	¹ / ₁ 23/7 ¹ / ₄	¹ / ₁ 23/4 ¹ / ₄	23.8 ¹ / ₄	—	—		—	—
Milano (b) (lire per quintal):											
Home-grown	147.50	147.50	147.50	147.50	147.50	147.50	95.75	97.50		98.00	100.05
Foreign	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	96.00	94.00		95.90	97.15
Maize.											
Braila: Average quality (1el p. quintal)	350	370	366	360	360	352	385	295		362	* 313
Chicago: No. 3 Yellow (cents p. 56 lb.)	57 ¹ / ₄	58 ¹ / ₄	57 ¹ / ₄	58 ¹ / ₄	57 ¹ / ₄	57 ¹ / ₄	47 ¹ / ₄	57 ¹ / ₄		51 ¹ / ₄	83
Buenos Aires (a): Yellow Plata (paper pesos per quintal)	5.10	5.35	5.15	5.20	4.90	5.16	6.67	9.32		6.89	7.79
Antwerpen (c. i. f., arrived; francs p. ql.):											
Bessarabian	n. q.	n. q.	n. q.	n. q.	n. q.	n. q.	84.80	n. q.		87.90	n. q.
Yellow Plata	150.00	151.00	150.00	146.00	133.00	131.25	84.50	110.45		98.20	101.00
Cinquantino (Argentine "Cuarentino")	154.50	154.00	152.00	148.00	139.00	138.00	102.50	126.75		118.05	109.05
London, Baltic (f.o.b., parcels; sh. per 480 lb.):											
No. 2 Yellow American (Baltimore)	29.7 ¹ / ₄	29/9	30/-	30/1 ¹ / ₄	29/9	29/10	—	—		—	—
Yellow Plata	¹ / ₁ 15/4 ¹ / ₄	¹ / ₁ 15/4 ¹ / ₄	15/6	¹ / ₁ 15/9	17/6	* 18/2	—	—		—	—
No. 2 White flat African	n. q.	19/6	19/6	n. q.	n. q.	n. q.	—	—		—	—
Rice (milled).											
Rangoon (delivery current month; rupees per 7500 lb.):										1939	1938
No. 2 Europe (Burma)	275-0	280-0	285-0	287-8	290-0	228-2	227-8	235-14		255-2	255-12
Kanungtoe, small mills specials	252-8	257-8	262-8	262-8	266-0	262-8	210-13	208-4		231-9	219-12
Big mills specials	245-0	249-0	252-8	252-8	255-0	251-4	208-0	192-4		226-14	207-0
Saigon (Indochinese piastres p. quintal):											
No. 1 Round white, 25 % broken	...	...	...	...	...	...	9.41	10.05		9.26	10.66
No. 2 Japan, 40 % broken	...	...	...	...	...	...	8.90	9.47		* 8.54	10.11
London (a) shipping current or following month; sh. p. cwt.):											
No. 2 Burma (c. i. f. U. K.) (°)	n. q.	n. q.	¹ / ₁ 14/9	¹ / ₁ 14/6	14/6	14/5 ¹ / ₄	7/4 ¹ / ₄	7/8 ¹ / ₄		* 7/8 ¹ / ₄	8/3 ¹ / ₄
Loonzain, Kanungtoe (f.o.b. Rangoon)	6/7 ¹ / ₄	6/9	6/10 ¹ / ₄	6/10 ¹ / ₄	6/10 ¹ / ₄	6/10 ¹ / ₄	—	—		—	—
No. 1 Saigon (f.o.b. Saigon)	7/-	8/6	8/9	9/1 ¹ / ₄	9/3	9/1	—	—		—	—
Siam Super (f.o.b. Bangkok) (°)	8/-	8/4 ¹ / ₄	8/9	9/1 ¹ / ₄	9/1 ¹ / ₄	9/0 ¹ / ₄	—	—		—	—
Tokyo: "Tymai", brown Japanese, average quality (yens per koku)	...	...	...	...	...	¹ / ₁ ...	35.20	33.97		37.27	34.26
Linseed.											
Buenos Aires (a): Current quality, 4 % impurities (paper pesos p. quintal)	17.55	17.20	16.60	16.25	15.85	16.29	13.91	15.26		15.12	14.31
Bombay: Bold (rupees per cwt.)	9-4-0	9-0-6	9-2-6	8-7-0	8-10-6	9-0-3	6-15-7	7-9-0		7-12-7	7-4-10
Antwerpen: Plata (c. i. f., arrived; frs. per quintal)	260.00	257.00	255.00	252.00	240.00	237.00	154.60	179.10		182.50	166.20
London (c. i. f., shipping current or following month; £ per long ton):											
La Plata	16-3-9	15-15-0	15-7-6	15-1-3	14-17-6	15-3-1	11-0-9	12-6-7		*12-2-3	11-10-11
Bombay	18-15-0	18-10-0	19-0-0	18-2-6	18-12-6	19-10-0	12-17-9	14-4-4		*14-10-3	13-3-9
Duluth: No. 1 Northern (futures; cents per 56 lb.) (°)	199	202 ¹ / ₄	200 ¹ / ₄	203	199	199 ¹ / ₄	176	198 ¹ / ₄		172 ¹ / ₄	183 ¹ / ₄
Minneapolis: No. 1 Northern (cts. p. 56 lb.)	210 ¹ / ₄	215 ¹ / ₄	211 ¹ / ₄	214 ¹ / ₄	211 ¹ / ₄	212 ¹ / ₄	n. 185 ¹ / ₄	205		180	190

* Indicates that the product was not quoted during part of the period under review. — n. q. = not quoted. — n. = nominal. — (a) Thursday prices — (b) Saturday prices.

(°) Oats: August-July; maize: May-April. — (°) London Standard. — (°) Quotations refer to May futures from January to May, to July futures in June and July, to September futures in August and September, and to December futures during the other months. — (°) Feb. g: 42 ¹/₄. — (°) Fixed maximum prices; prices of seed oats, which is not under control, are much higher. — (°) Shipping Vancouver. — (°) Shipping March. — (°) New crop, shipping April. — (°) Shipping March April. — (°) From Nov. 10 1939 to Feb. 9, 1940: 43.30.

DESCRIPTION	March	March	March	Feb.	Feb.	Average			
	15	8	1	23	16	Feb.	March	March	Commercial
	1940	1940	1940	1940	1940	1940	1939	1938	Season (1)
									1938-39 1937-38
Cottonseed.									
Alexandria (a) (piastres per ardeb):									
Upper Egyptian	64.0	63.1	64.2	65.9	67.7 ⁽¹⁾	66.1	58.4	56.0	57.7 55.3
Sakellaridis	62.7	61.9	62.8	64.5	65.8 ⁽¹⁾	64.6	54.7	51.3	54.5 50.7
London: Egyptian (c.i.f., shipping current or following month; £ per long ton)	8-12-6	8-10-0	8-10-0 ⁽¹⁾	8-12-6 ⁽¹⁾	8-12-6 ⁽¹⁾	8-3-5	6-4-3	5-19-1	6-3-5 6-1-6
Cotton.									
New Orleans: Middling (cents p. lb.) . .	n. 10.44	n. 10.55	n. 10.54	n. 10.80	n. 10.74	n. 10.66	8.70	9.01	8.75 8.87
New York: Middling (cents per lb.) . .	n. 10.90	n. 11.08	n. 11.07	n. 11.22	n. 11.14	n. 11.09	9.00	8.87	9.00 8.75
Bombay (rupees p. 784 lb.):									
Broach, f.g. (futures) (1)	256-4	265-8	268-8	265-12	261-8	268-9	153-2	170-0	156-2 166-11
Broach, f.g. (spot)	256-0	265-0	273-0	264-0	261-0	263-12	154-0	172-0	* 156-6 * 162-9
Oomra, fine (spot)	231-0	238-0	243-0	237-0	234-0	237-0	143-0	152-4	* 148-12 * 148-13
Alexandria (a) (talaris per kantar):									
Sakellaridis, f.g.f.	19.90	19.75	19.70	20.50	20.65 ⁽¹⁾	20.33	12.21	13.61	12.37 14.19
Giza 7, f.g.f.	18.22	17.67	17.52	17.82	18.22 ⁽¹⁾	17.89	12.06	13.04	12.34 12.81
Ashmuni, f.g.f.	17.87	17.57	17.77	17.82	17.62 ⁽¹⁰⁾	17.62	9.99	10.69	10.16 10.62
Liverpool (pence per lb.):									
Middling, super good	n. 8.28	n. 8.63	n. 8.59	n. 8.64	n. 8.72	n. 8.79	5.91	5.86	5.88 5.79
Middling	7.68	8.03	7.99	8.04	8.12	8.19	5.21	5.06	5.17 4.97
São Paulo, g.f.	n. 7.93	n. 8.23	n. 8.34	n. 8.34	n. 8.42	n. 8.46	5.21	5.28	5.14 5.16
Broach, good staple, f.g. (1)	n. 6.90	n. 7.12	n. 7.12	n. 7.12	n. 7.12	n. 7.25	—	n. 4.05	* n. 3.92 n. 4.04
C.P. Oomra, good staple, superfine (1) .	6.97	7.19	7.19	7.19	7.19	7.32	—	4.32	* 4.11 4.29
Giza 7, f.g.f.	10.51	10.46	10.42	10.58	10.55	10.64	6.96	7.44	7.22 7.42
Upper Egyptian, f.g.f.	10.27	10.13	10.08	10.22	10.14	10.22	5.93	6.10	6.00 6.31
Butter.									
									1939 1938
Kobenhavn (a): Danish, for export (crs per quintal)	233.00	270.00	270.00	270.00	286.00	279.60	248.20	211.00	239.00 230.49
Leeuwarden, Commission for butter quotations (a): Dutch, for export (cents per kg.) (1)	80	80	81	84	82	82	80	81	77 1/2 80 1/4
Antwerpen, auction: Belgian (frs p. kg) .	23.30	22.50	21.65	21.70	26.15	24.49	22.05	22.36	20.70 23.30
New York (b) 92 score, creamery (cents per lb.) . . . . .	...	28 1/2	28 1/2	28 1/2	28 3/4	...	24 3/4	30 1/4	26 1/2 28
Cheese.									
Roma: Roman Pecorino, choice (lire per quintal)	1,210.00	1,210.00	1,210.00	1,167.50	1,167.50	1,167.50	1,100.00	1,015.00	1,110.25 1,058.30
Alkmaar: Edam 40+, National Mark, factory cheese, small (florins p. 50 kg.)	22.25	25.25	25.00	25.50	26.00	23.81	18.15	22.19	19.35 21.33
Gouda: Gouda 45+, National Mark, farm made, 1st quality (florins p. 50 kg.)	30.50	32.00	32.00	31.50	31.25	31.50	24.30	25.37	26.52 25.72
Eggs.									
Antwerpen, auction: Belgian, average quality (frs. per 100)	57.00	66.00	66.00	68.00	107.00	80.50	43.20	41.00	56.00 58.80
Denmark (c): Danish for export (crs. per quintal)	120.00	120.00	120.00	130.00	136.00	129.50	75.50	73.50	112.53 116.70
Apeldoorn (d): Dutch, average quality 37/58 gr. each (fl. per 100) . . . .	...	...	...	...	...	...	3.30	2.60	3.85 3.85
Barneveld (a): Dutch, average quality 37/58 gr. each (fl. per 100) . . . .	...	...	...	...	...	...	5.28	2.62	3.94 3.90

* Indicates that the product was not quoted during part of the period under review. — n. q. = not quoted — n. = nominal. — (a) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks commencing on Thursdays. — (d) Prices on following Mondays.

(1) Cottonseed: Sept.-August; cotton: August-July. — (2) Quotations refer to April-May futures during the period September-May following, and to July-August futures during the other months. — (3) As from March 15, 1939: "fair staple". — (4) For home prices these quotations must be increased by a consumption tax which, as from Oct. 19, 1939, amounts to 80 cents per kg. — (5) Feb. 8: 67.1 — (6) Feb. 8: 65.6. — (7) Shipping March-April. — (8) Feb. 8: 20.45. — (9) Feb. 8: 18.02. — (10) Feb. 8: 17.32.

AVERAGE MONTHLY PRICES IN GOLD FRANCS PER QUINTAL ⁽¹⁾

DESCRIPTION	Feb 1940	Feb. 1939	Feb. 1938	DESCRIPTION	Feb. 1940	Feb. 1939	Feb. 1938
Wheat.				Rice.			
Winnipeg: No. 1 Manitoba .	8.23	6.75	16.22	Rangoon: No. 2 Burma . .	7.81	6.67	7.95
Chicago: No. 2 Hard Winter.	11.81	8.08	11.47	Salgon: No. 1 Round white.	...	7.43	9.66
Buenos-Aires: No. 2 Hard .	5.86	6.69	12.40	London: No. 2 Burma . . .	17.26	9.94	12.19
Karachi: White Karachi . .	9.03	8.75	10.65	(c.i.f. Londres)			
Antwerpen:				Cotton.			
No. 1 Manitoba (Atlantic)	15.77	9.66	20.31	New Orleans: Middling . .	n. 71.94	58.04	61.21
Bahia	15.42	7.86	15.46	Bombay (futures):			
London (f.o.b.):				M.g. Broach, f.g.	69.65	45.35	57.63
No. 1 Manitoba (Pacific) .	8.37	—	—	Alexandria:			
Argentine	n. q.	—	—	Sakellaris, f.g.f.	112.60	80.02	100.33
Australian	7.28	—	—	Pork.			
Rye.				Denmark (dead weight) . .	113.07	112.65	119.36
Minneapolis: No. 2 rye . . .	8.00	5.39	9.04	Rotterdam (live weight) .	...	77.13	101.10
Antwerpen:				Bacon.			
Danubian	14.24	8.66	13.03	London:			
La Plata	13.67	8.59	13.10	English, No. 1, lean sizable	..	141.16	149.74
Barley.				Danish, No. 1, sizable . .	...	141.16	149.74
Winnipeg: No. 4 Western . .	6.12	4.98	8.82	Butter.			
Minneapolis: No. 2 Feeding .	6.78	5.90	8.65	Kobenhavn: Danish	165.52	169.62	153.66
Antwerpen: Danubian . . .	13.72	7.65	11.31	Leeuwarden: Dutch	133.33	140.71	138.80
London (f.o.b.):				London:			
No. 1 Canadian feeding . .	n. q.	—	—	Danish . . . . .	...	206.09	191.83
Oats.				New Zealand, salted . . .	...	171.15	168.77
Winnipeg: No. 2 White . . .	7.33	5.50	11.31	Cheese.			
Chicago: No. 2 White	9.20	6.75	7.14	Alkmaar: Edam 40 + . . .	77.43	65.44	76.05
Buenos Aires: No. 2 White .	4.19	4.18	7.04	London: New Zealand . . .	...	93.05	101.84
London (f.o.b.):				Eggs (per 100).			
No. 1 Canadian feeding . .	6.93	—	—	Denmark: Danish (per ql.) .	76.66	56.65	78.20
Maize.				London:			
Chicago: No. 3 Yellow	6.94	5.83	6.94	English . . . . .	...	8.13	10.25
Buenos Aires: Yellow Plata.	4.17	6.31	9.72	Danish . . . . .	...	6.01	8.11
Antwerpen: Yellow Plata . .	13.62	8.51	11.51	Dutch . . . . .	...	9.98	8.83
Liverpool and London (f.o.b.):							
Yellow Plata	5.06	—	—				

⁽¹⁾ Extracts from tables published in the January, April, July and October issues; for method of conversion into gold francs per quintal, see those issues; for detailed specification of qualities and conditions, see "Prices by products".

**INDEX-NUMBERS OF PRICES OF AGRICULTURAL PRODUCTS
AND OF COMMODITIES BOUGHT BY THE FARMER**

DESCRIPTION	Feb.	Jan.	Dec.	Nov.	Oct.	Sept.	Feb.	Feb.	YEAR	
	1940	1940	1939	1939	1939	1939	1939	1938	1938-39 (*)	1937-38 (*)
Germany										
(Statistisches Reichsamt; products sold by farmers)										
Average for corresponding months 1909-10/1913-14 = 100.										
Cereals	112	113	112	109	108	113	112	111	110
Edible potatoes	110	111	108	108	110	106	106	116	114
Plant products	112	113	111	109	108	112	111	112	111
Meat animals	98	97	96	95	95	98	96	97	95
Livestock products (butter and eggs)	109	108	106	105	109	107	104	111	109
Livestock and livestock products	101	100	99	98	99	100	98	101	99
Total agricultural products	104	104	103	102	102	103	101	104	102
Germany										
(Statistisches Reichsamt; wholesale products)									1939	1938
1913 = 100.										
Foodstuffs of plant origin	108.2	107.6	107.5	107.5	107.6	107.6	105.3	107.9	105.9
Fertilizers	54.5	53.5	52.9	52.9	53.7	57.3	57.6	54.6	55.3
Consumption goods (*)	137.5	137.0	136.7	136.3	136.2	135.0	135.7	135.9	135.4
Wholesale products in general	108.2	107.6	107.4	107.1	106.9	106.5	105.7	106.9	105.7
England and Wales (*)										
(Ministry of Agriculture and Fisheries)										
Average 1927-1929 = 100.										
A: UNCORRECTED FOR SEASONAL VARIATION										
Cereals and farm crops	101	95	91	89	79	89	86	86 1/2
Livestock and livestock products	115	107	96	92	96	99	93	88
Total agricultural products	112	105	96	92	93	97	92	90
Wholesale products in general (*)	106.1	103.6	100.4	94.8	90.1	83.0	90.7	88.1	86.9
B: CORRECTED FOR SEASONAL VARIATION										
Cereals and farm crops	102	95	90	88	80	90	—	—
Livestock and livestock products	103	98	92	94	89	92	—	—
Total agricultural products	103	97	91	93	88	92	—	—

(*) Household goods of all kinds, and clothing. — (*) Index-numbers taking account of payments under the Wheat Act, the Cattle Subsidy Act, and Government payments for milk. — (*) Index-numbers by the Board of Trade, reduced to 1927-1929 = 100. — (*) Agricultural year: July 1-June 30.

DESCRIPTION	Feb.	Jan.	Dec.	Nov.	Oct.	Sept.	Feb.	Feb.	YEAR	
	1940	1940	1939	1939	1939	1939	1939	1938	1939	1938
Argentina										
(Banco Central de la Republica Argentina)										
1926 = 100.										
Cereals and linseed	73.1	79.9	85.0	80.7	80.3	83.9	72.4	111.2	77.6	90.6
Meat	103.6	103.7	105.1	108.9	103.9	92.9	88.0	102.3	94.4	94.8
Hides and skins	111.7	111.3	112.3	103.6	106.8	106.3	81.8	85.1	89.2	81.9
Wool	152.5	141.9	131.8	131.9	135.1	134.5	84.5	95.2	103.9	92.5
Dairy products	76.8	75.7	82.0	87.3	92.2	88.2	78.2	108.3	83.0	83.9
Forest products	116.1	116.6	116.6	109.5	109.5	102.3	101.6	98.9	104.2	100.0
Total agricultural products	87.3	91.0	93.8	90.9	90.7	91.6	77.0	106.0	83.5	90.6
Non agricultural commodities	133.0	134.1	129.1	129.1	126.2	119.3	109.2	112.4	114.8	109.4
Wholesale products in general	123.3	124.9	121.7	121.0	118.7	113.5	102.4	111.2	108.2	105.5
Australia (Commonwealth)										
(Commonwealth Bureau of Census and Statistics)										
1928-29 = 100.										
Agricultural field products	74.5	75.3	73.0	77.4	83.8	78.2	80.2	89.5	80.3	84.8
Pastoral products	77.9	77.8	77.4	...	76.6	72.8	66.5	69.7	71.4	79.0
Farmyard and dairy products	85.5	85.6	85.6	...	85.6	85.2	89.3	80.4	89.3	82.9
Total agricultural products	78.2	78.4	77.7	79.0	80.7	77.0	75.4	78.3	77.8	81.7
Belgium										
(Belgische Boerenbond — Boerenbond belge)										
Average of corresponding months 1909-1914 = 100.										
Field products . . . . .	...	717	647	608	597	535	480	575	518	541
Livestock products . . . . .	...	659	635	634	634	609	644	689	635	689
Total agricultural products . . . . .	...	677	639	626	622	586	592	653	598	643
Rent . . . . .	...	650	650	650	650	650	650	650	650	650
Agricultural wages . . . . .	...	970	960	950	940	935	900	870	924	887
Fertilizers . . . . .	...	519	512	513	495	466	475	471	479	471
Feedingstuffs . . . . .	...	786	706	637	696	637	547	678	582	631
Total production expenses (including those not specified) . . . . .	...	806	805	788	794	779	752	761	766	757
Canada										
(Dominion Bureau of Statistics, Internal Trade Branch)										
1926 = 100.										
Field products (grain, etc.) . . . . .	...	...	...	...	51.4	53.6	54.7	87.5	...	69.0
Livestock and livestock products . . . . .	...	...	...	...	86.3	82.0	81.5	81.1	...	81.3
Total Canadian farm products . . . . .	...	...	...	...	64.5	64.2	64.7	85.1	...	73.6
Fertilizers . . . . .	...	...	...	...	...	...	83.0	75.2	...	78.9
Consumers' goods (other than foodstuffs, beverages and tobacco) . . . . .	...	...	...	...	...	...	76.1	78.0	...	77.2
Wholesale products in general . . . . .	...	...	81.7	80.3	79.3	78.2	73.2	83.6	75.4	78.6

(1) July 1-June 30.

DESCRIPTION	Feb.	Jan.	Dec.	Nov.	Oct.	Sept.	Feb.	Feb.	YEAR	
	1940	1940	1939	1939	1939	1939	1939	1938	1939	1938
Chili										
(Dirección General de Estadística)										
1913 = 100										
Cereals . . . . .	...	...	445.2	449.1	446.2	435.3	443.5	526.9	441.1	551.0
Other plant products . . . . .	...	...	416.5	431.3	431.0	405.9	330.0	362.7	396.9	375.4
Meat animals . . . . .	...	...	406.6	419.2	423.3	424.2	325.4	369.7	366.1	380.3
Meat . . . . .	...	...	356.8	358.9	386.9	289.0	280.1	308.6	303.4	324.7
Total agricultural products . . . . .	...	...	418.4	428.4	430.5	405.2	359.1	408.0	400.7	424.3
Domestic industrial products . . . . .	...	...	445.9	447.2	443.4	424.8	428.0	464.7	433.6	472.5
Wholesale products in general . . . . .	...	...	523.0	526.6	523.3	497.1	473.6	506.9	496.7	510.7
United States										
(Bureau of Agricultural Economics)										
Average 1909-10 to 1913 14 = 100.										
A: UNCORRECTED										
FOR SEASONAL VARIATION										
Cereals	91	90	87	79	77	83	66	89	72	74
Cotton and cottonseed	85	85	82	75	74	76	70	68	73	70
Fruits	76	66	65	66	73	73	78	68	77	73
Meat animals	101	103	101	107	112	117	116	110	110	114
Dairy products	118	119	118	117	112	107	107	121	104	109
Chickens and eggs	98	91	97	117	108	102	91	94	94	108
Miscellaneous	107	113	104	98	94	98	92	97	93	98
Total agricultural products	101	99	96	97	97	98	92	97	92	95
Commodities bought for use in living and production	122	122	122	122	122	122	120	126	121	122
Prices, interest and taxes paid by farmers	128	128	128	128	128	128	126	131	126	129
Agricultural wages ⁽¹⁾	—	119	—	—	126	—	²⁾ 117	²⁾ 118	122	124
B: CORRECTED										
FOR SEASONAL VARIATION										
Cereals	90	91	89	82	80	85	65	88	—	—
Cotton and cottonseed	87	88	86	77	75	73	72	69	—	—
Fruits	82	72	73	75	75	75	82	73	—	—
Truck crops (market garden crops)	168	117	96	130	128	114	108	111	—	—
Meat animals	102	107	107	112	113	116	117	111	—	—
Dairy products	114	114	112	113	111	108	104	117	—	—
Chickens and eggs	97	80	76	92	96	101	90	94	—	—
Miscellaneous	114	114	104	95	94	99	98	104	—	—
Total agricultural products	102	100	97	97	96	98	93	98	—	—
Agricultural wages ⁽¹⁾	—	124	—	—	122	—	²⁾ 122	²⁾ 123	—	—
United States										
(Bureau of Labor)										
1926 = 100.										
Grains	72.8	73.5	71.6	64.1	61.6	65.1	54.7	73.0	58.7	60.6
Livestock and poultry	65.6	67.2	63.8	66.1	70.6	76.3	79.2	78.1	72.2	79.0
Other farm products	68.9	68.6	68.4	68.3	66.1	64.6	62.9	63.5	62.6	63.9
Total agricultural products	68.7	69.1	67.6	67.3	67.1	68.7	67.2	69.8	65.4	68.5
Agricultural implements	93.4	93.4	93.3	93.3	93.4	93.5	93.2	96.2	93.4	95.5
Fertilizer materials	72.9	77.4	74.5	73.0	70.6	69.2	69.3	72.3	70.0	69.2
Mixed fertilizers	73.7	73.5	73.7	72.6	72.6	72.6	73.7	72.3	73.0	72.2
Cattle feed	93.7	93.0	91.7	91.5	82.9	..	78.2	86.7	82.7	76.9
Non-agricultural commodities	80.8	81.5	81.8	81.6	82.0	81.3	78.9	81.9	79.6	80.6
Wholesale products in general	78.7	79.4	79.3	79.2	79.4	79.1	76.9	79.8	77.2	78.6

(1) 1910-1914 = 100. — (2) January.

DESCRIPTION	Feb	Jan	Dec	Nov	Oct	Sept	Feb	Feb	YEAR	
	1940	1940	1939	1939	1939	1939	1939	1938	1939	1938
Hungary										
(Central Royal Bureau of Statistics)										
1929 = 100										
Cereals	89.7	88.9	87.7	86.8	85.1	85.0	85.1	89.7	85.9	89.1
Total raw plant products ⁽¹⁾	91.0	88.8	82.5	79.9	80.0	79.6	76.9	70.6	79.5	76.9
Meat animals meat and lard	75.2	69.0	65.7	66.6	67.9	69.9	62.9	72.9	65.1	68.4
Total livestock products ⁽¹⁾	75.9	71.5	67.7	68.4	66.8	67.4	65.4	67.6	65.6	65.6
Total agricultural products	86.3	83.4	77.8	76.3	75.9	75.8	73.3	69.7	75.2	73.4
Products of agricultural industries	95.8	96.6	95.7	95.0	93.8	92.7	95.0	104.8	93.9	103.0
Industrial raw materials and products	97.0	96.5	96.0	95.3	94.5	93.4	92.1	94.5	93.1	93.3
Wholesale products in general	93.0	91.7	89.2	88.2	87.5	86.5	85.2	86.1	86.3	86.8
Ireland										
Department of Industry and Commerce)										
Average 1911 1913 = 100										
Agricultural products in general		133.6	137.9	134.2	133.2	126.8	109.4	107.4	120.0	111.9
Lithuania										
(Lietuvos Bankas)										
1926 1929 = 100										
Cereals	61	56	54	50	46	42	39	43	43	41
Cattle, fowls	59	55	54	53	53	52	53	49	53	51
Leather, hides, wool	78	75	74	71	57	53	54	54	56	51
Meat, dairy products and eggs	63	58	57	53	50	46	49	47	48	47
Total agricultural products	62	57	56	53	50	46	46	46	48	46
Wholesale products in general	72	67	64	60	56	52	51	51	54	51
Norway										
(Kgl Selskap for Norges Vel)										
Average 1909 1914 = 100										
Cereals	175	173	170	170	170	170	166	176	168	173
Potatoes	236	212	206	202	217	184	147	210	174	188
Pork	151	160	159	154	154	152	125	113	127	117
Other meat	170	167	173	166	168	180	166	190	179	187
Dairy products	198	193	193	192	188	179	179	173	176	165
Eggs	120	107	132	165	157	140	99	121	124	124
Concentrated feedingstuffs	178	174	170	167	159	151	154	153	158	152
Maize	179	175	172	170	168	153	159	157	158	149
Fertilizers	111	113	112	112	90	90	94	102	98	95
New Zealand										
(Census and Statistics Office)										
Average 1909 1913 = 100										
Dairy products			132.5	129.2	126.2	125.5	124.9	110.5	123.0	121.0
Meat			173.8	166.4	158.1	156.3	170.7	180.9	163.9	175.2
Wool			107.1	107.1	107.1	107.1	108.9	121.1	109.1	117.6
Other pastoral products			131.9	117.0	107.9	98.4	92.5	107.5	96.9	94.7
All pastoral and dairy products			137.7	133.2	129.0	127.6	131.4	132.9	129.1	134.0
Field products			154.5	154.5	154.5	157.8	145.1	135.9	151.9	139.6
Total agricultural products			138.1	133.7	129.6	128.3	131.7	133.0	129.6	134.2

(¹) Including unspecified products — (²) Agricultural year: April 1-March 31

DESCRIPTION	Feb	Jan	Dec	Nov	Oct	Sept	Feb	Feb	YEAR	
	1940	1940	1939	1939	1939	1939	1939	1938	1938	1937
									(¹)	(²)
Netherlands										
(Bureau of Agriculture)										
Average 1924 25 to 1928 29 = 100										
Plant products	74	71	70	70	68	66	59	61	59	63
Livestock products	75	73	69	70	70	64	60	65	63	66
Total agricultural products	75	72	69	70	69	65	60	64	62	65
Wholesale products in general (¹)	87.6	86.2	84.7	83.6	80.8	75.4	69.9	74.2	73.7	71.9
Agricultural wages	75	75	75	75	75	75	74	68	74	69
Sweden										
(Sveriges Allmänna Lantbrukssällskap)										
Average 1909 1913 = 100										
Cereals			134	133	126	113	103	124	113	114
Plant products (²)			135	134	127	116	105	124	115	115
Meat animals			151	152	158	163	142	126	150	133
Dairy products			183	171	166	158	163	143	160	142
Livestock and livestock products			174	167	164	158	156	138	157	139
Total agricultural products			161	156	152	144	139	134	143	131
Feedingstuffs			165	164	162	155	144	141	149	140
Fertilizers			107	100	100	93	94	97	96	96
Building materials			220	220	217	215	180	188	201	182
Machinery and implements			232	228	278	208	204	217	211	218
Sundries			151	139	135	127	120	129	127	124
Total commodities purchased			168	164	163	154	144	148	151	146
Wholesale products in general				162	159	151	134	142		137
Agricultural wages								204		204
Switzerland										
(Schweizerischer Bauernverband)										
1914 = 100										
Slaughter cattle		124	132	132	129	125	107	118	118	117
Slaughter pigs		141	141	143	143	128	124	130	128	125
Milk (base price)		123	123	123	117	117	121	119	121	120
Total agricultural products		130	132	132	128	124	117	123	122	126
Feedingstuffs (²)	131	129	127	124	121	118	109	102	113	105
Fertilizers (²)	102	100	104	105	109	103	100	93	101	96
Wholesale products in general (²)	129.7	127.7	125.1	122.6	120.1	116.8	105.2	109.4	111.2	107.1
Yugoslavia										
(National Bank of the Kingdom of Yugoslavia)										
1926 = 100										
Plant products	97.0	91.7	90.7	87.0	76.8	73.5	85.8	87.1	82.5	85.8
Livestock products	83.6	85.3	82.8	80.7	71.0	67.7	61.9	67.2	68.7	65.8
Industrial products	96.5	95.5	91.6	86.5	82.9	79.5	76.5	80.1	79.8	78.2
Wholesale products in general	94.9	93.3	90.9	86.8	80.1	76.6	76.6	79.9	79.3	78.3

(¹) Index numbers calculated by the Central Statistical Bureau of the Netherlands base 19 6 1938 — (²) Including unspecified products. — (³) Index numbers calculated by the Bundesamt für Industrie, Gewerbe und Arbeit base July 1914 —
⁴) Agricultural year July 1 - June 30 — (⁵) Calendar year — (⁶) Provisional data

APPENDIX**THE SECOND WORLD AGRICULTURAL CENSUS****The Agricultural Census in Germany, 1939.**

The first results of the agricultural and forestry census taken on May 17, 1939, as part of the general census of population, occupations and enterprises are now available. They relate not only to land utilization mentioned in the last Bulletin but also to the number of agricultural holdings which are classified according to their total area. The census covers the territory of Germany as it was at the time of the census, exclusive of Memelland.

For purposes of comparison with the 1933 census, we reproduce the figures of the distribution of holdings by size groups in 1939 for the former territory of the Reich. It is to be noted that the lower limit of the smallest size group has been changed

Number of Holdings by Size Groups.

Total area of holdings	1939		1939	1933	Increase (+) or decrease (-) in 1939 %	
	Present territory		Former territory			
	Number of holdings	%	Number of holdings			
0.5 and not exceeding 1 ha	566,501	14.5	481,247 (1)	366,839	+	31.2
1 " " " 2 "	588,504	15.1	479,123	482,379	-	0.7
2 " " " 5 "	944,205	24.2	764,061	796,790	-	4.1
5 " " " 10 "	747,107	19.2	619,474	621,952	-	0.4
10 " " " 20 "	594,501	15.2	484,460	451,663	+	7.3
20 " " " 50 "	352,682	9.1	280,025	267,310	+	4.8
50 " " " 100 "	65,725	1.7	56,001	54,572	+	2.6
100 " " " 200 "	20,884	0.5	16,869	16,600	+	1.6
200 " " " 500 "	12,625	0.3	10,399	10,623	-	2.1
500 " " " 1,000 "	4,581	0.1	3,858	3,919	-	1.6
1,000 hectares and over	3,521	0.1	2,710	2,807	-	3.5
TOTAL	3,900,836	100.0	3,198,227	3,075,454	+	4.0

(1) In 1933 — 0.51 hectares and not exceeding 1 ha

The increase in the number of holdings in the former territory between 1933 and 1939 is mainly due to the change in the limits of the lowest group. About 88 per cent. of the holdings have a total area of less than 20 hectares. Medium holdings, 20 to 100 hectares, represent 11 per cent., large holdings only 1 per cent.

Comparable figures for previous years on land utilization are not yet available owing to changes in territory. The comparable data for 1938 issued by the Reich Statistical Office are for systematical reasons so calculated that they do not correspond exactly with the original data for last year. Consequently, we reproduce below only the results of the census of holdings.

Areas Cultivated in Germany (1) in 1939.

Acres

Oats	8,111,558	Potatoes, early	334,615
Spelt, etc.	118,450	Potatoes, main crop	7,487,778
Winter wheat	5,366,965	All other root crops except those	
Spring wheat	635,466	for seed	71,793
Maize for grain	270,601	Hemp	39,162
Winter meslin	264,955	Flax	143,775
Spring meslin	1,382,511	Colza	96,227
Winter barley	1,090,264	Rape	16,576
Spring barley	3,727,531	Sugar-beet	1,402,331
Buckwheat	49,175	Hops	35,500
Winter rye	11,749,049	Other commercial crops	82,749
Spring rye	201,590	Sugar-beet for seed.	27,709
Edible peas	107,752	Other roots for seed	15,096
Fodder peas	38,495	Main crops for green manure.	100,531
Field beans	120,461	Fallow	321,343
Edible beans	12,563		
Bitter lupins.	69,971	<i>Able land</i>	<i>54,933,902</i>
Sweet lupins	140,672	Meadows without irrigation	
Vetches for grain	96,862	system	15,910,549
Mixed leguminous crops for grain	66,551	Irrigated meadows	1,019,031
Other mixtures for grain	237,348	Meadows for litter	439,320
All other cereals and leguminous		Pasture	10,360,294
crops for grain	26,890	Vines	311,768
Alfalfa	1,324,477	Commercial horticultural areas	119,107
Clover of all kinds	4,185,705	Gardens	1,547,886
Maize for green fodder	209,796	Orchards	325,971
Sweet lupins for green fodder		Nurseries	39,364
and hay.	60,443	Ornamental gardens	227,244
Other leguminous for fodder	351,851	Osiers	29,532
Arable pasture	715,828	<i>Agricultural land</i>	<i>85,293,968</i>
Arable meadows	579,644	Forests	42,302,748
Mangels	2,339,490	Unexploited marshy land	1,062,475
Fodder carrots	39,142	Uncultivated land	4,488,304
Turnips	494,702	Waters	2,601,507
Other fodder plants	252,130	Other land	8,104,907
Vegetables and garden plants			
of all kinds grown on arable			
land	319,724	TOTAL AREA	143,854,059

(1) Including Memelland, according to the returns of cultivated area in 1938.

The Agricultural Census in the Netherlands.

In the note published in last month's Crop Report on the World Agricultural Census, the Netherlands was mentioned among the list of countries which had already taken their census in 1939.

A census of crops and livestock was in fact carried out in the Netherlands between May 15 and 27, 1939, by the statistical organization created under the law relating to the agricultural crisis of 1933. However, the census which is now being organized for the month of May 1940 will be enlarged, with the adoption of several suggestions contained in the Standard Questionnaire proposed by the International Institute of Agriculture, so that this census will correspond more closely with the programme of the World Agricultural Census.

Prof. UGO PAPI, *Segretario generale dell'Istituto, Direttore responsabile.*

MONTHLY CROP REPORT AND AGRICULTURAL STATISTICS

The following explanations refer to crop conditions quoted in the crop notes and in the tables. — Crop condition according to the system of the country: Germany, including Ostmark and Sudetenland, Bohemia and Moravia (Protectorate); Hungary and Luxemburg: 1 = excellent, 2 = good, 3 = average, 4 = poor, 5 = very poor; Finland: 8 = very good, 6 = above the average, 5 = average; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = poor; Estonia, Latvia, Lithuania, Poland, Romania and Sweden: 5 = excellent, 4 = good, 3 = average, 2 = poor, 1 = very poor; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; Portugal: 100 = excellent, 80 = good, 60 = average, 40 = poor, 20 = very poor; Switzerland: 100 = excellent, 90 = very good, 75 = good, 60 = fairly good, 50 = average, 40 = rather poor, 30 = poor, 10 = very poor; U. S. S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = poor; Canada: 100 = crop condition promising a yield equivalent to the average yield of a long series of years; United States: 100 = crop condition which promises a normal yield; Egypt: 100 = crop condition which promises a yield equal to the average yield of the last five years. — For other countries the system of the Institute is employed: 100 = crop condition which promises a yield equal to the average of the last ten years

NOTE: The countries are listed throughout by continents (Europe, followed by the U. S. S. R., America, Asia, Africa and Oceania) in the French alphabetical order. In the tables the Northern Hemisphere precedes the Southern Hemisphere.

VEGETAL PRODUCTION

THE WORLD WHEAT TRADE IN 1939-40 AND THE CONDITION OF THE STANDING CROPS.

Last month we estimated world wheat production in 1939 and reviewed the statistical situation of world exportable supplies and wheat requirements during the present season. Of the statistics received by the Institute during April, for wheat there may be mentioned only the revised crop estimates of Lithuania and Luxemburg, which both show slight variations from the former figures, and the first estimates of the Cyprus and New Zealand crops, which are slightly larger than the figures calculated last month. These new revisions involve practically negligible modifications in the totals published in March. These totals, therefore, still stand, and we would refer the reader to last month's article, without reproducing the figures again this month.

The World Wheat Trade in 1939-40.

The lack of official trade statistics of various countries and the delay in the receipt of information from other countries make it impossible to follow exactly world wheat movements this season. At this period all the export figures of the principal exporting countries during February would normally be already known to the Institute and the total of the first seven months of the season from August 1 to February 28 could be constructed. This year,

however, the only complete official statistics are those of Canada, the United States, Argentina, Australia, Hungary, Romania, India, Turkey and Uruguay. The export figures for February of Bulgaria and Yugoslavia have not yet been received by the Institute. For Yugoslavia even January figures are not available. The statistics of the countries of French North Africa, the U. S. S. R. and minor exporting countries are lacking altogether from the beginning of the season. In view of this lack of information, we have considered whether we should cease the publication of the monthly table of world wheat trade or whether we should attempt to estimate the volume of world exports by filling in the gaps with approximate estimates. We have decided that a general survey, even though based on incomplete and partly conjectural data, is still to be preferred, particularly in view of the fact that the missing figures are comparatively small and may be estimated with reasonable accuracy, the probable error not being likely to exceed 2 per cent. of the total. We have, however, made no attempt to estimate the monthly imports of European countries, since the available figures are quite insufficient.

*World net Exports of Wheat (including flour in terms of wheat). **

(million bushels)

EXPORTS BY MONTHS				EXPORTS BY COUNTRIES			
Months	1939-40	1938-39	1937-38	Exporting Countries	Seven months: August February		
	(1)				1939-40	1938-39	1937-38
August	51	54	38	Canada (3)	112	102	64
September	46	47	38	United States (3)	26	56	58
October	52	56	48	Argentina	103	40	39
November	48	48	49	Australia	35	50	53
December	72	43	44	Total four countries	276	248	214
January	50	53	48	Romania	22	28	25
February	46	47	46	Hungary	28	18	7
March . . . . .	...	50	50	Other Europ count (4) (1)	12	7	9
April . . . . .	..	48	44	North Africa . . . . .	..	6	10
May . . . . .	...	61	40	India	2	0	9
June . . . . .	...	64	44	U. S. S. R . . . . .	...	35	33
July . . . . .	...	47	46	Other countries (5) . (1)	4	6	4
Total August-February	363	348	311	Total other countries . (6)	87	100	97
Total Year	(2) 610	618	535	General Total	363	348	311

* Aggregate net exports of the normal exporting countries (possible net imports into certain of these countries are not deducted from the totals).

(1) Partly estimated — (2) Forecast March 1940 — (3) Net exports adjusted in accordance with the monthly variations in stocks of Canadian wheat in the United States and stocks of United States wheat in Canada. — (4) Bulgaria, Lithuania, Poland and Yugoslavia. — (5) Iran, Iraq, Turkey, Chile and Uruguay. — (6) Rough estimate

These approximate figures of world wheat exports, as given in the table above, show that world wheat movements remained fairly steady during the first seven months of the season, the monthly totals varying between 46 and

52 million bushels, without sharp variations between one month and another, except in December, when there was a sudden heavy increase, owing to very large exports from Canada. The increase in aggregate exports from August to February, compared with last season, is entirely due to this rise in December exports, which more than offset the slight decreases during the other months as compared with the corresponding figures of last season. Exports from August 1939 to February 1940 show an aggregate increase of about 4 per cent. on the same total of the 1938-39 season and thus reveal that the war has not so far reduced the world wheat trade.

Of the four major exporting countries the only one which has succeeded in increasing her exports to any extent is Argentina, which disposed of a large proportion of its wheat stocks left over from the heavy 1939 crop. Canada, while retaining first place among the wheat exporting countries, has so far been able only very slightly to exceed Argentine exports, although her supplies are very much larger. The marketing of Australian wheat, despite the extremely large crop, is proceeding slowly owing to the poor demand of the Far East and the insufficiency of the tonnage on the Western route. The exports of the United States are also proceeding at a slow rate as a result of the considerable difference between domestic and world prices. The Danube countries have been able to market large quantities, exceeding considerably the already heavy exports of last year; Hungary in particular has disposed of a large part of her surplus, while Romania has not yet reached last year's total. It may be noted that the past very severe winter has not facilitated the movement of Danubian wheat. As regards the minor exporting countries, for the majority of which no official statistics are available, it may be assumed that the probable increase in exports from North Africa, resulting from the heavy surplus from the very good crop of 1939, has only been able to offset partly the sharp drop this season in Soviet wheat exports, which last year were very heavy, particularly in the first few months of the season.

Last month, revising the statistical situation, we estimated total exports during the present season at 610 million bushels; during the first seven months total exports amounted to about 363 millions, so that during the remaining five months from March to July 1940 they should amount, according to our estimate, to about 247 million bushels, or an average of 49 millions per month, against 52 millions actually exported on the average during the first seven months. A slight decrease in world wheat trade during the coming months may therefore be anticipated if these forecasts are correct. This view is confirmed by the fact that recently, as a result of the war, some fairly important wheat importing countries are no longer in a position to take wheat from their usual suppliers.

As a result of the exports during the months August 1 to February 28, the exportable balance held by the various exporting countries of the world on March 1, 1940 amounted to about 926 million bushels, an increase of 173 millions, or 23 per cent., on the corresponding total on March 1, 1939. The estimated import requirements for the five months March to July, on the other hand, are barely 237 million bushels.

WHEAT. — *Exportable Supplies on March 1, 1940.* ⁽¹⁾

(million bushels)

COUNTRIES	Year 1939-40			Year 1938-39		
	Total exportable supplies	Net exports from August 1 to February 28	Remainder on March 1	Total exportable supplies	Net exports from August 1 to February 28	Remainder on March 1
Canada	455	112	343	238	102	136
United States	257	26	231	266	56	210
Argentina	165	103	62	261	40	221
Australia	192	35	157	136	50	86
European exporting countries . . .	165	62	103	145	53	92
North Africa, U S S R and others	55	(3) 25	30	55	47	8
<i>Total</i>	<i>1,289</i>	<i>363</i>	<i>926</i>	<i>1,101</i>	<i>348</i>	<i>753</i>

(1) Supplies afloat excluded — (2) Partly estimated. — (3) Rough estimate

All the exporting countries held on March 1, 1940 a much larger exportable wheat surplus than on March 1, 1939, with the exception of Argentina, which showed a very considerable drop. The greatest proportion of supplies, amounting to about 60 per cent., were held in North America, but Australia and the Danube countries held much larger supplies than usual, which leads to the belief that the quantity to be carried over to next season will be abnormally high also in these countries.

Condition of the Standing Crops.

In Europe the weather continued rather unfavourable for crops; the excessively wet autumn was followed by a severe winter, with heavy and frequent snowfalls, which impeded the alternative sowings on fields which could not be sown at the proper time. Temperatures were abnormally low throughout the winter and rose appreciably only at the beginning of the spring but this improvement lasted only about two weeks; in the first half of April a period of rather severe cold set in accompanied somewhere by further snow. The brief period of warmth in the second half of March caused a rapid melting of the snow with a resultant overflowing of rivers and the flooding of large plains in the central and particularly in southeastern parts of the Continent. Seasonal work, impeded by these conditions, was also delayed in some places by a shortage of labour and consequently it is very doubtful if the intended sowings of winter wheat and spring wheat can be carried out completely. It appears, however, that the damage caused by the bad weather is not as heavy or extensive as was feared and that, in many cases, the wheat has resisted the low temperature fairly well,

often even in fields with a thick ice crust. Nevertheless, in most cases, it was not possible to make up the loss as in other years by re-sowings of wheat, owing to the lateness of the season. Hence wheat will be replaced by barley, oats and, in particular, maize in the east of the continent. The wheat area to be harvested in the coming summer in Europe will hardly reach the level of last year. The difference however should not be great. The condition of the crops at the end of the winter was none too favourable for, apart from frost and flood damage, the growth of the plants was appreciably late in nearly all cases and they will need very favourable weather for the rest of the season if they are to give a good yield. Prospects at present are not bright and point to a total European wheat crop distinctly below last year's level.

In the Soviet Union the winter was similar, with severe cold and heavy snow falls. In the south the freezing of the soil to a great depth caused some damage in places with an insufficient snowcover. Except for these losses, which do not in any case appear to be above the average, the crops came through the winter in almost normal conditions and the situation at the beginning of the spring was considered fairly satisfactory on the whole, despite changeable weather and fluctuations in temperature at the end of March and early in April. These conditions hindered spring sowings in particular and this work was definitely later this year than last.

The provisional crop estimate for the United States made on April 1 indicates a winter wheat production of 426 million bushels; this is about three-quarters of the 1939 crop, which was practically equal to the average of the preceding five years. This is a light crop though slightly larger than what was expected last December. It reflects the damage caused by the long drought of last autumn in the important western area. The first half of April was favourable for crop growth, good rains having fallen in the greater part of the the regions most affected by the drought, and it is probable that these have consolidated and perhaps improved the prospects of the crop to a noticeable degree. Spring sowings, despite rather unfavourable weather, are making good progress and are in advance of last year. The survey of farmers' intentions pointed to a spring wheat area of 19.4 million acres, which would be an increase of 11 per cent. on the area actually sown last year but 13 per cent. short of the average of the years 1934 to 1938. Moisture reserves, which are an important factor in the spring wheat crop, do not appear to be as favourable as last year, but they are sufficient for the first stage of growth.

Moisture reserves in Canada also are rather poor. It appears that the large cultivated area of last year will be repeated this year and perhaps increased, despite the large supplies remaining from the excellent crop of 1939. Preparatory work for sowing, though delayed by the unfavourable weather, has made progress and sowings had begun at the middle of April.

A very large crop is reported in India from an area which showed little change from last year or the average. The good results are to be attributed to the favourable course of the season, though crop growth at the beginning of the season was impeded by drought, which at the end of January even threatened to compromise the crop irremediably. The heavy and well distributed

rains after the end of January reversed the situation and the expected production, as indicated by the recently issued preliminary estimate, is one of the best obtained during the last twenty years.

Wheat Production in India.

(Million bushels).

Years of harvest	Production in the Punjab		Total production of India	
	1st estimate	Final estimate	1st estimate	Final estimate
1930	146	157	368	391
1931	135	133	347	347
1932	125	118	348	337
1933	110	122	241	353
1934	131	121	371	350
1935	132	131	379	363
1936	125	131	362	352
1937	146	112	352	364
1938	140	158	380	403
1939	124	137	344	371
1940	147	...	390	...

In the Near East the grain crops were satisfactory in nearly all parts. Flood damage was reported from several parts of Turkey. As for the Far East, the condition on April 1 in Japan was almost normal. Serious efforts are being made to increase wheat production in Japan, Chosen and Manchukuo.

Prospects in North Africa are still satisfactory, high yields being expected from appreciably larger acreages, both in the French countries and in Egypt. Rain was needed in some places, however, at the beginning of April.

Good rains in Argentina and in the western States of Australia and those which fell recently in the eastern States of the Commonwealth will facilitate land preparation for the coming sowings.

G. CAPONE.

CURRENT INFORMATION FROM VARIOUS COUNTRIES ON WHEAT, RYE, BARLEY AND OATS.

France: During March and the first half of April the temperature was slightly below normal and there were some moderate rains. The growth of cereals is retarded. Seasonal work is progressing despite the lack of labour. It is estimated in official circles that the area sown to wheat will be about 12 million acres. (*Bulletin des Halles*).

Greece. The cold and frost of February, in addition to the frequent rain, snow and sudden changes of temperature of the first three weeks of March were unfavourable for the growth of cereals, particularly spring crops and those sown on wet land. The bad weather also retarded the cleaning and weeding of wheat. In the last ten days of March, however, the weather was comparatively fine and warmer, thus permitting a resumption of operations. Hoeing and weeding were carried out on a large scale during this period. Oats were sown in the north during this period and spring wheat in Epirus.

Hungary: The weather during March was comparatively cold with severe night frosts. Although during the first part of the month there was little precipitation, the second half had abundant precipitation, particularly in the form of snow in mountainous regions. By the end of the month the rise in temperature had caused a rapid thaw of enormous quantities of snow and there were severe floods over large areas, the extent of the damage, which will be considerable, has not yet been determined. On dry lands farmers are trying to complete as rapidly as possible preparations for spring crops. Spring sowing had not yet begun generally.

(Telegram of April 23) Winter cereals have suffered severe damage from frost and floods. Wheat and rye, particularly late-sown crops have had to be resown. The spring is late; it has been possible to effect only small sowings of spring cereals and growth has made little progress.

Ireland: The first ten days of March were cold and dry. In the middle of the month rain was general, but cold and dry weather then returned until the end of the month. Crops came through the winter satisfactorily. Cultivation was well forward and spring cereals were sown in satisfactory soil and weather conditions.

Netherlands: The winter was favourable for cereals, except for a certain amount of damage done by frosts which came after the melting of the snow.

Luxemburg The severe and prolonged frost and heavy snow falls during the winter did some damage to winter cereals.

Spring sowings have begun in parts and are taking place in average to poor conditions. They are retarded about a fortnight compared with a normal season. This lateness is due principally to the fact that the ground, from being frozen to a depth of 2 ½ feet, only thawed slowly, and partly also to the heavy and continuous rains of March. The crop condition of winter wheat at the beginning of April was 3 in the system of the country, against 4.1 on April 1, 1939; corresponding figures for winter rye are respectively 2.5 and 2.6.

Romania. Winter wheat came through the winter well in most parts of the country, exceptions, however, are the southern half of Basarabia, eastern Muntenia and Dobrogea, where crops suffered from intense cold. Winter barley suffered more serious damage.

Towards the end of the first week of April the temperature suddenly fell below freezing point, rains, snow and storms were reported in all parts of the country, in some districts extensive areas were flooded. It is not yet possible to estimate the extent of the damage to winter crops resulting from the return of cold weather.

Field operations and the sowing of spring cereals, which in the north had not yet begun owing to the excessive rain and the cold weather, were interrupted elsewhere, since the saturated state of the ground hampered ploughing.

United Kingdom. Early-sown spring cereals are growing well and show a strong plant. Much of the March sown wheat has a better appearance than late autumn wheat which did not get a start before the hard winter. More spring wheat than usual has been sown, in some cases to patch autumn wheat which failed, but the big increase in acreage will be in barley and oats.

It was recently officially announced that 1,000,000 acres of new land had already been ploughed up for arable farming, against a projected programme of 2,000,000 acres by the end of the spring. In some counties, in fact, the programme has been exceeded. The success of the ploughing-up campaign is largely due to the county war agricultural committees, which gave every assistance and advice to farmers and even in some cases exercised their powers of issuing compulsory orders to plough.

Area sown to Winter Cereals, in thousand acres.

(The years indicated are those of the harvest)

COUNTRIES	WHEAT			RYE			BARLEY			OATS		
	1940	% 1940		1940	% 1940		1940	% 1940		1940	% 1940	
		1939	1934		1939	1934		1939	1934		1939	1934
		= 100	to 1938		= 100	to 1938		= 100	to 1938		= 100	to 1938
Greece	2,557	110.2	124.2	151	97.4	87.5	493	95.2	95.4	382	117.0	111.3
Lithuania	346	94.9	90.7	1,248	102.2	100.1	—	—	—	—	—	—
Luxemburg	35	91.1	76.2	16	89.8	89.2	—	—	—	—	—	—
Romania	7,798	81.6	99.9	853	78.5	84.0	226	88.1	115.2	—	—	—
Canada	813	117.5	114.1	766	128.3	119.8	—	—	—	—	—	—
United States	45,014	97.1	88.1	5,640	78.5	86.8	—	—	—	—	—	—
India	32,381	100.4	98.6	—	—	—	—	—	—	—	—	—
Egypt	1,503	100.1	103.5	—	—	—	262	96.0	93.5	—	—	—

(1) Rye for all purposes, including an allowance for spring-sown rye.

Switzerland: Preparation of the land last autumn was seriously hampered by continual bad weather and the mobilization of men and draught animals. An area of only about two-thirds of a normal acreage could be sown to winter cereals. Moreover, owing to cold weather and excessive soil moisture, germination and growth were greatly retarded. Thus in most cases cereal crops entered the winter at a poor stage of development. In addition, the conditions of the winter were unfavourable for growth, owing to frosts on fields unprotected by snow and later on to flooding. After the melting of the snow many frosts and thaws occurred, laying bare the plants and causing further damage. The condition of winter crops has not been so poor for many years as it is this spring. In many places wheat and rye have not survived the winter, so that large areas are being resown with spring cereals. Late-sown wheat crops in particular have suffered severely during the winter. As the ground was frozen to too great a depth to permit ploughing during the winter or in good time in the spring, spring sowing has been very much retarded. On high lands, in particular, spring sowing could not be completed owing to unfavourable and generally wet weather, so that much late sowing is being carried out. The following table shows crop condition figures as on April 1, expressed as percentages of a very good crop:

	1940	1939	1938	1937
Winter wheat	63	83	83	79
Winter rye	59	81	84	68
Winter barley	64	81	85	78
Meslin	63	86	85	78
Spelt	64	88	85	81

Yugoslavia: March weather was variable and rather wet. The first ten days were rather cold, particularly towards the end of this period, when the lowest temperature in the country reached — 13° F. During the remainder of the month, however,

the weather became steadily warmer, particularly towards the end of the month, when the temperature reached its maximum of $+ 81^{\circ}$ F. Frequent rain and thawing caused flooding of the principal rivers, such as the Danube, the Sava, the Tissa, the Morava and their tributaries. In some districts the floods were catastrophic, being more serious than the very severe floods of 1882 and 1932. Rain at the beginning of April aggravated the situation, causing further damage to arable land.

U. S. S. R.: The weather in March was very variable especially in the European territory of the Union. Temperatures rose considerably at the end of the month in southern areas of the European territory (Ukraine, Crimea, North Caucasus, etc.). They fell sharply early in April but soon rose again.

Owing to the changeable weather, spring sowings made slow progress. The total area of spring crops sown on April 1 throughout the Union was 4,779,000 acres against 10,379,000 acres in 1939 and 14,394,000 acres in 1938; these areas represented 2.5 and 7 per cent. respectively of the provisions of the Plan. In view of the fact that the weather in the Asiatic territories was better this year than in the European territories and that sowings in some Asiatic regions (Kirghiz, Uzbekistan) were made more rapidly than last year, the delay in the European territory appears still greater.

In Ukraine sowings on April 1 of last year covered 1,161,000 acres but the corresponding figure this year was barely 59,000 acres, or only 0.2 per cent. of the area contemplated by the Plan. On [April 5, the area sown was 6,971,000 acres, or 3 per cent. of the Plan, against 16,986,000 acres, or 8 per cent. of the Plan, at the same date last year. To make up for lost time, it will be necessary to use every interval of fine weather.

Owing to plentiful precipitation in autumn and winter moisture reserves are ample and the outlook is consequently promising.

According to the Commissar for Agriculture, the condition of the winter crops on April 1 was better than it was a years ago.

A decree issued on April 8 introduces wide changes in the system of compulsory deliveries by *Kolkhozi* of cereals and other products. Previously, deliveries were proportional to the area cultivated for each crop but henceforth the entire arable area including gardens and new lands which must, according to the Plan, be brought into cultivation is taken as the base for cereals. For new land, the decree becomes effective in the second year of cultivation. Certain industrial crops such as cotton, sugar beet, flax and hemp are excluded from the calculation.

The purpose of the new regulation is a fuller and more rational use of land in all collective farms. Compulsory deliveries to the State, including rice, have been fixed at 33,400 million lb.

Argentina: In order to improve the commercial and industrial quality of Argentine wheat and to increase yields during the 1940-41 season, the Ministry of Agriculture has divided the area normally cultivated to wheat, which comprises the Provinces of Buenos Aires, Santa Fe, Entre Rios, Córdoba, part of Santiago del Estero and the National Territory of La Pampa into six divisions, according to climatic and soil conditions. For each division the most appropriate varieties have been indicated in order of preference, divided into two groups "recommended" or simply "mentioned", with the indication of the sowing periods.

United States: The official estimate of the winter wheat crop based on conditions at April 1, indicates a prospective production of 2,557,290,000 centals (426,215,000 bushels) or 24.4 per cent. less than the outturn obtained in 1939 (338,059,000 centals, 563,431,000 bushels) and 23.8 per cent. less than the average of the five years 1934 to 1938 (335,654,000 centals, 559,423,000 bushels). This estimate, though somewhat better

than the tentative figure given in December with the estimate of seeded acreage, shows that the shortage of moisture at the time of planting and germination has resulted in lower than average yields.

As indicated a month ago, the intended acreage of all spring wheat in 1940 is put at 19,425,000 acres, or 10.8 per cent more than the acreage actually planted in 1939 (17,532,000) but 12.9 per cent less than the average acreage of the five-year period 1934-38 (22,304,000). Increased seedings were indicated for all the important spring wheat States, the greatest absolute increase being in the hard red spring wheat States. A substantial increase is expected also in the Pacific Northwest where dry weather prevented intended seedings of winter wheat.

The estimate of spring wheat intentions includes 3,539,000 acres of durum wheat. This compares with a planted acreage of 3,220,000 last year and a five-year average of 3,002,000 acres, percentages, 109.0 and 117.9.

The increases planned in spring wheat are mostly within quota limitations and are a natural response to the heavy loss of winter wheat acreage expected in Kansas and adjoining States and to the increase in price. If these losses of winter wheat are as heavy as was indicated in December, if the area of spring wheat planned on March 1 is planted, and if the percentage of the acreage abandoned is about the same as the average during the last 10 years, with the extreme drought years 1934 and 1936 omitted, the total acreage of wheat to be harvested would be only about 46 million acres. This would be less than in any year since the war of 1914-18 except 1934.

The prospective seedings of barley in 1940, at 14,606,000 acres, are slightly larger than those of last year. Of the principal barley States increases are expected in North Dakota, Nebraska, Kansas and Colorado where the crop has gained popularity as a substitute cash crop and as an early feed crop, particularly in years of moisture shortage. Minnesota, Iowa and Wisconsin report less acreage this year than in 1939 and South Dakota reports indicate no change. In California a decrease of 8 per cent. is in prospect. Although barley is a relatively unimportant crop in other parts of the country, substantial increases are reported in Washington and Oregon and the Ohio Valley States.

Acreage loss through abandonment has varied widely in the past 10 years and this wide variation makes it difficult to forecast probable harvested acreage. However, if the abandonment in 1940 approximates to the average for the ten years 1929-38, excluding the heavy losses of 1933, 1934 and 1936, the area for harvest would be about 13,350,000 acres compared with 12,600,000 acres harvested in 1939. The abandonment of barley in 1939 amounted to 13.4 per cent. of the seeded acreage and the ten-year average (including 1933, 1934 and 1936) was 15.2 per cent.

The prospective 1940 acreage of oats, indicated by the intention survey at 35,818,000 acres, is substantially below the average of recent years and the second smallest in 31 years. It is only 0.9 per cent. larger than the very low 1939 acreage of 35,512,000 acres. It plantings are as much as indicated the steady downward trend in oats seedings will be checked for the first time in five years.

Prospective acreage increases are greatest in South Central and South Atlantic States, where there has been a general increase in feed crops and where an acreage of spring oats, larger than usual, will be sown due in part to frost damage to fall and winter sown grain crops. In the North Central States, which have over three-fourths of the total, the prospective acreage is practically the same as a year ago. The Western States show some increase and the North Atlantic States a slight decrease.

India: During the week ended March 25, light showers benefited crops in Punjab which were in average to good condition in irrigated and unirrigated areas. Hail

caused some damage in Sialkot and Shahpur. Rainfall was general in the following week except in Hissar, Gurgaon and Multan. Crops maintained average to good conditions. Hail damage occurred in Guzerat, Mianwali and Lyallpur.

In the Central Provinces, the week ending March 23 was cloudy. Wheat threshing continued. The following week was clear and warm.

According to the third report, received by the Institute on April 19, the wheat area of India (third estimate) is put at 33,460,000 acres compared with a corresponding estimate of 33,167,000 acres in 1939 and with an average of 33,955,000 acres in the five years ended 1938, percentages, 100.9 and 98.5

Production (first estimate) is put at 233,790,000 centals (389,650,000 bushels). The corresponding estimate for 1939 is 207,980,000 centals (346,640,000 bushels), while the average of the corresponding estimates of the five years 1934 to 1938 is 224,470,000 centals (374,120,000 bushels), percentages, 112.4 and 101.2. This excellent outturn is due to the favourable conditions of the year and the resultant good yields per acre, the area cultivated having shown little change from last year.

Japan: The crop condition of wheat and barley on April 1 was normal

Palestine: During March well distributed rains were registered throughout the country. Weather was changeable and temperatures moderate. Crops have wintered in excellent conditions and no losses are reported. General condition of crops on 1 April was excellent. Preparations for sowing of spring crops are in full swing under perfect conditions.

Egypt: In spite of the variable temperature during part of March, the crop condition of wheat and barley at the beginning of April was normal. Wheat, 101, against 100 on March 1, 1940 and 102 on April 1, 1939; barley, 101, as on March 1, 1940 and on April 1, 1939. Grain formation and development among main-season wheat crops are in progress. The growth of grains among early crops in Upper Egypt has finished and maturation is beginning. Early barley crops have begun to ripen and harvesting was beginning at mid March in Upper Egypt.

See the table of supplementary area and production figures on pages 288-9

CURRENT INFORMATION ON MAIZE.

Greece: The improvement in the weather in the last ten days of March permitted the active resumption of preparations for maize sowing.

Argentina: The first official estimate of maize production in 1939-40 has confirmed the forecast of a very large production, namely 243,130,000 centals (434,160,000 bushels), which exceeds very greatly (126.7 per cent.) not only the poor crop of last season, but also all other crops so far obtained, with the exception of the record of 253,090,000 centals (451,950,000 bushels) in 1934-35. This season's crop was obtained from a sown area of 17,800,000 acres, which is the largest acreage recorded with the exception of that of 1935-36. The large size of this year's crop is due to the very favourable season, marked by heavy and well distributed rain in the principal maize zones and sunny weather during maturation.

United States: As published last month, the Crop Reporting Board, on the basis of the intention survey of March 1, estimates prospective maize plantings this year at 87,770,000 acres. This would be 4.1 per cent. less than the plantings of 1939 and 10.2 per cent. less than the five-year (1934-38) average. The prospective reduction marks the fourth consecutive year of decline and indicates the smallest acreage to be planted in over 40 years.

Area and Production of Maize.

COUNTRIES	† AREA					† PRODUCTION							
	1939 and 1940	1938 and 1939	Aver. 1933 to 1937 and 1938- 1939- 1938	% 1939 and 1939-40		1939 and 1940	1938 and 1939	Average 1933 to 1937 and 1933-34 to 1937/38	1939 and 1940	1938 and 1939	Average 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40	
				1938 and 1939- 1938	Aver- age = 100							1938 and 1938- 1939	Aver- age = 100
ooo acres					ooo centals			ooo bushels of 56 lb.					
* Albania . . .	230	216	...	...	...	3,116	2,795	...	5,564	4,991	...	...
* Germany . ⁽¹⁾	271	347 ^{a)}	202	78.0	...	8,369 ^{a)}	4,642	...	14,944 ^{a)}	8,290	...	...
* Bohemia- Moravia (Protect.) .	23	22	—	103.9	—	—	—	—	—	—	—	—	
* Bulgaria . .	1,527	1,731	1,720	88.2	88.8	11,735	19,756	...	20,955	35,278	...	...
* Spain . . .	1,058	...	1,075	...	98.4	...	16,048	...	...	28,656	...	...
* France . . .	814	841	844	96.8	96.4	12,756	11,301	...	22,779	20,181	...	...
* Greece . . .	684 ^{a)}	671 ^{a)}	625	102.0	109.4	5,766	4,398	5,663	10,296	7,853	10,112	131.1	
* Hungary . .	3,150 ^{a)}	2,901 ^{a)}	2,840	96.6	98.9	49,624 ^{a)}	58,688 ^{a)}	47,080 ^{a)}	88,615 ^{a)}	104,801 ^{a)}	84,072 ^{a)}	—	
* Italy . . . ⁽¹⁾	3,185	3,297	3,220	96.6	98.9	58,077	58,948	...	103,710	105,265	...	...
* Italy . . . ⁽²⁾	456	427	401	106.7	113.9	6,658	6,107	...	11,889	10,905	...	...
* Malta . . .	0	0	0	85.7	97.1	2	3	4	4	5	7	84.0	
* Poland . . .	...	218	225	...	...	2,783	2,055	...	4,969	3,670	...	55.7
* Portugal . .	...	971	1,036	...	...	6,531	6,794	...	11,662	12,132	...	...
* Romania . .	12,187	12,349	12,563	98.7	97.0	133,407	112,819	110,865	238,227	201,462	197,973	118.2	
* Switzerland .	...	2	2	...	...	54	51	...	96	92	...	...
* Yugoslavia .	6,575 ^{a)}	7,022 ^{a)}	6,708	93.6	98.0	81,443	104,849	98,225	145,434	187,232	175,403	77.7	
* Yugoslavia .	...	...	...	...	...	...	...	...	...	...	...	82.9
Total Europe	22,596	23,091	22,884	97.9	98.7	270,242	283,403	264,042	482,576	506,077	471,504	95.4	
* U. S. S. R. .	...	6,618	7,968	...	...	...	60,811 ^{a)}	84,056	...	108,592 ^{a)}	150,100	...
* Canada . . .	183	180	159	101.7	115.2	4,534	4,306	3,485	8,097	7,690	6,223	105.3	
* U. S. A. . ⁽¹³⁾	88,803	92,222	96,176	96.3	92.3	1,466,717	1,434,830	1,156,162	2,619,137	2,562,197	2,064,575	102.2	
* Mexico . . .	78,861	(82,710)	(77,139)	95.3	102.2	(1321,634)	(1289,288)	(993,335)	(2360,600)	(2303,265)	(1773,813)	102.5	
Total N. Am.	88,803	92,402	96,335	96.3	92.4	1,471,251	1,439,136	1,159,647	2,627,234	2,569,887	2,070,798	102.2	
* China . . .	...	11,150	...	...	...	...	141,429	...	...	252,552	...	...
* Korea . . .	...	342	302	...	...	...	2,174	2,134	...	3,882	3,811	...
* Japan . . .	...	135	123	...	...	...	1,850	1,612	...	3,303	2,878	...
* Manchukuo .	...	4,351	2,978	...	...	54,675	55,336	41,241	97,634	98,814	73,645	98.8
* Palestine . .	19	21 ^{a)}	16	93.1	122.8	137	177 ^{a)}	161	244	315 ^{a)}	287	77.4	
* Syria & Leb. .	49	48	52	101.3	95.1	...	606	538	...	1,081	961	...	
* Transjord. .	...	...	...	...	...	...	3	3	...	6	6	...
* Turkey . . .	...	1,171	1,071	...	...	...	13,305	11,997	...	23,759	21,423	...
* Algeria . . .	16	15	18	104.4	85.9	...	94	106	...	168	189	...	
* Egypt . . . ⁽¹⁴⁾	1,606	1,545	1,614	103.4	99.1	33,584	34,449	35,071	59,972	61,516	62,627	97.0	
* Kenya . ⁽¹⁵⁾	...	9	7	...	...	...	178	129	...	318	230	...
* French Mo- rocco . . .	...	112	112	...	...	...	1,817	1,824	...	3,244	3,257	...
* Anglo-Egypt. Sudan . . .	...	1,141	1,015	...	...	...	4,792	4,360	...	8,558	7,785	...
* Tunisia . ⁽¹⁶⁾	...	26	26	...	...	...	70	236	...	124	422	...
* Argentina . ⁽¹⁷⁾	62	43	52	145.2	118.3	...	121	126	...	217	224	...	
* Argentina {	(17792)	(13097)	(16538)	135.8	107.6	...	...	...	...	...	...	...
* Chile . . . ⁽¹⁸⁾	...	105	113	...	...	243,127	107,233	181,315	434,156	191,488	323,777	226.7
* Uruguay . .	559	541	553	103.3	101.1	...	1,399	1,380	...	2,498	2,464	...	
* Java & Mad .	...	5,016	5,060	...	...	...	3,498	2,938	...	6,247	5,246	...
* Madagascar .	...	247	224	...	...	...	43,003	43,422	...	76,792	77,539	...
* Madagascar .	...	247	224	...	...	...	2,205	2,063	...	3,937	3,684	...
* Un. of S. Afr. . ⁽¹⁹⁾	6,724	6,972	5,764	96.4	116.7	35,696	52,218	33,488	63,743	93,246	59,800	68.4	
* New Zealand	...	6	7	...	...	4,522	5,988	8,534	8,075	10,693	15,240	75.5
TOTALS	138,612	137,045	140,826	101.1	98.4	2,113,234	1,978,118	1,723,628	3,773,634	3,532,354	3,077,908	106.8	

† The years indicated are those of the harvest, single years referring to the Northern Hemisphere, double years to the Southern. — * Not included in the totals. — ‡ In calculating the totals account has been taken of the probable area cultivated in some countries for which estimates of production are available but not those of area. — (1) Including Austria and Sudetenland. — (2) Excluding Sudetenland. — (3) For the former territory of Germany the production is estimated for the years 1933 to 1936. — (4) Average 1933-35. — (5) Area sown. — (6) Including the northern territory annexed by Hungary but excluding the Sub-Carpathian territory. — (7) Frontiers as at the end of 1937. — (8) Maize sown in spring. — (9) Maize sown in summer. — (10) Area provided for by the Plan. — (11) Approximate estimate. — (12) Maize for all purposes. — (13) Maize harvested as grain. — (14) Average 1931-37. — (15) *Nili* maize. — (16) *Sefi* maize. — (17) European crops only. — (18) Maize and sorghum. — (19) Area harvested. — (20) Cultivation by natives.

In the Corn Belt, where the present supply of maize is abundant and where the acreage allotments of the Agricultural Adjustment Administration in the commercial area are about 12 per cent. lower than last year, the prospective plantings are 7 per cent. below the 1939 planted acreage and 21 per cent. below the ten-year (1929-38) average. In the Northeastern States 1940 plantings are expected to be about the same as last year and 5 per cent. above the ten-year average. In the South Atlantic States the prospective acreage is the same as in 1939 and 4 per cent. above average. In the South Central States the intended acreage is slightly less than in 1939 and about 2 per cent. below average. In the Western States the 1940 acreage is expected to be about 3 per cent. below average.

Assuming an abandonment of maize acreage in 1940 of 1.6 per cent., which is about average for the ten-year period 1929-38, excluding the heavy losses in the two severe drought years of 1934 and 1936, the probable acreage for harvest in 1940 would be about 86,400,000 acres. Such an acreage would be about 3 per cent. less than that harvested in 1939 and the smallest for harvest since 1894.

Uruguay Maize crop prospects in March were generally good, except for early varieties, the growth of which in several districts was seriously affected by lack of rain and late frosts.

Netherlands Indies Java and Madura. — The Department of Agricultural Statistics of the Central Statistical Office communicates the following details on the maize area:—

	1940 acres	1939 acres
Area harvested in January	853,800	787,000
Area of standing crops at the end of January	1,790,800	1,774,700
Area harvested in February	912,600	1,148,800
Area harvested from January 1 to February 29	1,764,000	1,935,000
Area of standing crops at the end of February	1,026,700	778,100

Indochina Owing to present events, the Indochinese Union only supplies very retarded reports on crops. The Institute has only just received a report on maize crop condition at the beginning of January 1940. This is as follows.

Crops suffered from drought in December in Annam and Tonkin; in the remainder of the Union sowing and soil preparation continued actively. The area under cultivation, according to the first official estimate, is slightly reduced in Cambodia, owing to the extension of tobacco and groundnut cultivation, but is on the increase in Cochinchina, where farmers have been able to sow maize crops on land where rice was destroyed by floods.

Union of South Africa: Maize crop prospects in the Union are very poor this season owing to severe drought following excessive rain in many parts earlier in the season and unusually heavy insect damage.

In the Orange Free State the drought continued in February except in the east where good rains fell. In many parts of the west there was no hope of harvesting maize for grain and large fields were cut for silage.

In Transvaal also the drought continued in February, although light, scattered showers fell over most parts of the province after the middle of the month. Crop prospects further deteriorated owing to severe damage by cut-worms and locusts.

In Natal February weather was very hot and rather dry. Hailstorms did local damage. Crop prospects are very poor owing to the ravages of drought, locusts and caterpillars.

CURRENT INFORMATION ON RICE.

Argentina Rice production in 1939-40 is officially estimated at 2,436,000 centals (5,413,000 bushels), against 2,291,000 (5,092,000) in 1938-39 and a preceding five-year average of 746,000 (1,658,000), percentages 106.3 and 326.4. The size of the crop is due to a considerable increase in acreage and to favourable weather conditions in the principal rice-growing areas.

United States The Crop Reporting Board estimates rice seedings in 1940, on the basis of growers' intentions on March 1, at 1,057,000 acres. This would be 1.7 per cent. larger than the planted area of 1939 (1,039,000 acres) and 10.3 per cent. above the average planted area of the five years 1934 to 1938 (958,000 acres). State acreage allotments for 1940 under the Agricultural Adjustment Program have been increased over those of 1939.

The California and Arkansas acreages are expected to be about the same as last year although there may be some reductions in California, where floods have occurred. Irrigation water in this State was reported to be sufficient. An increase is likely in Texas and Louisiana.

Taiwan The growth of rice proceeded normally at the beginning of April.

India In Bengal moderate heavy rain had an unfavourable effect on crops in some places during the week ended March 27. The crops needed sunshine. In the following week rainfall was light and beneficial. The weather was cloudy in the Central Provinces in the week ended March 23. The following week was cloudy and warm.

Paddy sowing was going on in Madras in the two weeks ended March 30. Crop condition was fair.

Netherlands Indies Java and Madura. — The Department of Agricultural Statistics of the Central Statistical Office communicates the following details on the rice area.—

	1940 acres	1939 acres
<i>Area harvested in January.—</i>		
Wet padi	161,900	153,900
Dry padi.	19,300	16,600
<i>Area of standing crops at the end of January —</i>		
Wet padi	4,581,600	5,255,000
Dry padi.	837,900	866,400
<i>Area harvested in February —</i>		
Wet padi	205,600	165,800
Dry padi	62,300	59,600
<i>Area harvested from January 1 to February 29:—</i>		
Wet padi	369,400	81,800
Dry padi.	319,800	76,100
<i>Area of standing crops at the end of February:—</i>		
Wet padi	6,399,400	6,747,600
Dry padi.	783,100	836,500

Indochina: Owing to the present events, the Indochinese Union only supplies very retarded reports on crops. The Institute has only just received a report on rice crop condition at the beginning of January 1940 in the Union, with the exception of Laos.

In North and Central Annam, the planting out of third-month rice proceeded throughout December, though retarded in some districts by prolonged drought. Late rice of the second season had been harvested, yields were normal. In South Annam third-month rice was planted out and tenth-month rice was harvested, with unsatisfactory yields. In the far South the harvesting of twelfth-month rice had begun.

In Cambodia the sowing and planting out of rice on flooded land were in progress; mid-season, main-season and flood-season rice were harvested. Yields were below those of last year.

In Cochinchina mid season rice was harvested in nearly all parts, as well as main-season and early rice. Crop condition of late rice was good in nearly parts.

In Tonkin the planting out of fifth-month rice was carried out. The "mas" had a less satisfactory appearance than in December owing to prolonged drought.

See the table of supplementary area and production figures on pages 288-9.

CURRENT INFORMATION ON POTATOES.

Greece: The distribution to co-operatives and growers of large quantities of potato seeds recently imported from Ireland and the extensive propaganda, carried out by the Ministry of Agriculture for increasing the area under this crop, have resulted in a considerable expansion of the potato acreage this year. Moreover, expert advice with detailed instructions has been given to growers in order to combat mildew. The improvement in the weather during the last ten days of March enabled the continuation of potato planting, which had already been carried out in warmer areas, the islands and other parts of the south while work was continued in the mountains. A much larger acreage than last year is confirmed.

Hungary. Owing to floods, preparatory work for potato planting had not yet begun at the beginning of April.

U. S. S. R.: The area planted to potatoes in the south, i. e. Central Asia and Transcaucasia, amounted on April 1 to 18,000 acres, or 0.2 per cent. of the area forecast in the Plan for the Union as a whole.

Argentina. Lifting of early varieties in March gave generally good yields. The late varieties were in normal condition.

United States: The prospective acreage of potatoes in 1940, as indicated by the Crop Reporting Board's survey of farmers' intentions on March 1, will be about 3,130,000 acres. This would be 2.0 per cent. larger than the planted acreage of 1939 (3,069,000) but 7.1 per cent. smaller than the average planted acreage of the years 1934 to 1938 (3,370,000 acres).

See the table of supplementary area and production figures on pages 288-9.

THE BEET AREAS IN 1940.

The Institute has unfortunately not received a sufficient number of replies to its enquiry relating to the intended beet areas of the current year. Consequently, it will be possible at present to publish only such first estimates as have been received in place of the complete European table it was hoped to give.

As usual, the 1940 figures are compared with those of last year and with the average of the five years 1934 to 1938.

	1940	1939	Average 1934 1938	% 1940 1939 = 100	Average = 100
	(acres)				
Belgium	133,500	133,518	117,364	100	114
Finland	8 150	8,352	8,664	98	94
Hungary	131,000	129,782	97,420	101	—
Ireland	65,000	44,000	55,420	148	117
Italy	108,000	368,313	256,870	111	159
Netherlands	128,000	107,500	104,411	120	123
Romania	137,800	131,872	89,120	105	155
Sweden	136,000	125,413	127,817	108	100
Switzerland	8,400	8,896	4,964	94	100
Yugoslavia	148,000	113,670	58,691	130	253
Japan	40,500	48,174	42,481	96	100

In the case of Belgium, the estimate published last month, showing an increase of 9 per cent. on last year, has been replaced by an estimate issued by the General Secretariat of the Ministry of Agriculture.

The estimates of Italy and Switzerland are unchanged.

The figures for Hungary for 1940 and 1939 relate to the new territory of this country while the average relates to the former territory.

The Central Statistical Office of Sweden states that the figure given for Sweden is largely approximate.

The Central Statistical Office of Turkey has issued no figures but has reported that an increase in the beet area is very probable.

The *Verein der Deutschen Zuckerindustrie* writes that it is not known whether an enquiry into beet areas will be made or when estimates will be published, if at all.

According to the Commissariat for Agriculture, an increase in the beet acreage on 1939 is forecast in the U. S. S. R.

All the published figures have been received from official sources or from sugar associations. It is learned from private sources that an increase of 25 per cent. is expected in Bohemia and Moravia.

CURRENT INFORMATION ON SUGAR.

France: As a result of the assistance given to agriculture by the military authorities, it was possible to prepare the land in March and April for beet sowing (*Bulletin des Halles*).

Hungary: Owing to floods preparations for sugar-beet sowing had not yet begun at the beginning of April

Production of Cane-Sugar.

COUNTRIES	1939-40 (1)	1938-39	Average of 1933-34 to 1937-38	1939-40 (1)	1938-39	Average of 1933-34 to 1937-38	% 1939-40	
							1938-39 = 100	Average = 100
	ooo centals			short tons				
AMERICA.								
Antigua	304	493	514	15,200	24,640	25,688	62	59
Argentina	11,288	10,141	8,147	564,000	510,000	407,341	111	139
Barbados	2,866	3,505	2,517	140,000	175,250	125,843	82	114
Brazil	26,896	25,353	23,161	1,340,000	1,270,000	1,158,050	106	116
Cuba	62,567	61,730	57,752	3,128,000	3,100,000	2,887,585	101	108
Ecuador	540	489	413	27,000	24,500	20,657	110	131
United States (La & Fl)	10,140	11,660	7,196	507,000	583,000	359,800	87	141
British Guiana	4,299	4,189	3,978	215,000	210,000	198,699	103	108
Jamaica	2,608	2,642	2,086	130,400	132,100	104,278	99	125
Martinique	1,323	1,433	1,104	70,000	72,000	55,206	92	120
Mexico	6,834	7,772	6,037	340,000	388,602	301,854	88	113
Peru	8,686	8,157	8,702	434,000	410,000	435,102	106	100
Puerto Rico	22,046	17,042	18,515	1,000,000	852,000	925,750	129	119
Dominican Republic . .	9,921	9,502	9,030	500,000	475,000	451,494	104	110
St Kitts	584	836	659	29,200	41,816	32,944	70	89
Trinidad	2,866	2,877	2,983	140,000	143,870	149,129	100	96
Venezuela	551	540	489	28,000	27,000	24,472	102	113
Total America	174,319	168,361	153,283	8,607,800	8,439,778	7,664,084	104	114
ASIA.								
Taiwan	28,660	32,915	19,895	1,430,000	1,646,000	994,719	87	144
India	61,112	45,534	59,190	3,056,000	2,276,700	2,959,455	134	103
Japan	3,386	3,596	2,359	169,300	179,800	117,951	94	144
Java	34,613	34,392	19,839	1,730,000	1,720,000	991,927	101	174
Philippines	24,912	22,708	23,455	1,230,000	1,140,000	1,172,739	110	106
Total Asia	152,683	139,145	124,738	7,635,300	6,962,500	6,236,791	110	122
AFRICA.								
Egypt	3,417	3,573	3,180	171,000	178,634	159,001	96	107
Mauritius	5,059	7,084	5,886	252,930	354,180	294,310	71	86
Reunion	1,764	1,764	1,745	90,000	90,000	87,267	100	101
Union of South Africa	11,464	11,616	9,426	570,000	580,800	471,290	99	122
Total Africa	21,704	24,037	20,237	1,083,930	1,203,614	1,011,858	90	107
OCEANIA.								
Australia	19,842	18,409	15,933	1,000,000	920,000	796,647	108	125
Hawaii	19,070	19,930	18,961	953,000	996,000	948,051	96	101
Fiji Islands	2,822	2,822	2,912	141,000	141,000	145,602	100	97
Total Oceania	41,734	41,161	37,806	2,094,000	2,057,000	1,890,300	101	110
TOTALS	390,440	372,704	336,064	19,421,030	18,662,892	16,803,033	105	116

(1) Approximate data.

Yugoslavia: In order to avoid the situation of last season, when sugar-beet production was not sufficient to cover completely national sugar requirements, the Government recently took special measures for encouraging the cultivation of this crop during the present season. The tendency to increase the acreage under sugar-beet is also encouraged this year by the steady rise in domestic sugar prices.

U. S. S. R.: At the beginning of April the sowing of sugar-beet was begun in Kirghistan and Georgia, while preparations were being made for sowing in North Caucasus and Ukraina. It is considered that soil moisture reserves, owing to the wet autumn and the heavy falls of snow during the winter, offer good promise for this year's crop.

On April 5, according to the report of the Commissariat for Agriculture, 62,000 acres, or 2 per cent of the Plan, had been sown on Kolkhozi, against 85,000, or 3 per cent, sown at the same date last year. The sugar-beet cultivated on Kolkhozi in 1939 represented about 95 per cent of the total area cultivated in the Union. It appears from these figures that the area to be cultivated to sugar-beet this year will be larger than last.

The total area harvested in 1939 was 2,928,000 acres and the average of 1934-1938 was 2,984,000 acres.

Argentina: The condition of sugar-cane was generally good during March and promised a plentiful crop.

United States: The revised estimate of the production of raw beet sugar in 1939 is 35,120,000 centals (1,756,000 short tons) compared with 36,060,000 centals (1,803,000 short tons) of raw sugar produced in 1938 and an average of 28,160,000 centals (1,408,000 short tons) in the years 1933 to 1937. Percentages, 97.4 and 124.7. The revised estimate of the production of cane sugar is given in the table.

Taiwan: The growth of cane in old and new plantations was proceeding normally at the beginning of April.

Netherlands Indies: J a v a. — In the first half of March rains were variable. Some plantations, particularly in the east of Java, report very little rain, whereas in the west the rain was very heavy, with the result that the cane in some parts suffered from drought and in others from floods. Generally the growth of sugar-cane was poor, lodging increased and flowering was irregular. In the second half of March the weather was rather changeable but was wetter, warmer and with adequate sunshine. Crop condition did not change much but colour improved a little and flowering increased considerably. The first analyses indicated a satisfactory sugar content and favourable conditions for maturation (*Aneta*).

Egypt: The planting of sugar-cane is in progress. It has been finished among the main-season crops in the provinces of Qena and Aswan. The germination and growth are satisfactory. The cutting of late areas of the last crop and the despatch to the factories continues. The unit-yield is on the whole normal.

See the table of supplementary area and production figures on page 288.

CURRENT INFORMATION ON VINES.

France: During March and the first half of April the temperature was slightly below normal and there were some moderate rains. Labour and tractors were insufficient in almost all parts. Nevertheless, most of the work was done and pruning was practically completed on April 15 (*Moniteur vinicole*).

In last month's Crop Report we stated that the Inter-Ministerial Viticultural Commission had semi-officially estimated the 1939 wine production at 1,890 million Imperial (2,270 million American) gallons. This figure is evidently the total of French and Algerian production, since the latter is always included in the metropolitan production. Total production was thus higher than that of 1938 (1,760 million Imperial or 2,110 million American gallons) and the previous five-year average (1,720 or 2,060 million gallons).

Greece: In spite of unfavourable weather conditions in the first three weeks of March the pruning of vines made regular progress and was already completed in the South. In some parts of the South coast budding out was beginning, particularly of the sultana variety, in Krete, and of vines for table grapes, which have suffered from the sharp drop in temperature and the strong cold winds.

Romania: The severe winter this year froze vineyards even in districts where they are not covered with earth. Vines covered with earth had serious bud losses, amounting to about 20 per cent. About 30 per cent. of the vines could not be covered with earth owing to the unfavourable weather and the shortage of labour and they have suffered from frost. Thus a poor crop is anticipated.

Yugoslavia: According to unofficial reports, Dalmatia produced in 1939 16,000,000 Imperial gallons (19,280,000 American gallons) of wine, two-thirds of which was red wine and one-third white wine. This production of Dalmatia was of rather poorer quality than last season and was 2,200,000 Imperial (2,650,000 American) gallons smaller than the 1938 production. Frequent rain during flowering, and the spread of fungus diseases were the principal causes of the poor 1939 vintage in this region.

Argentina: Hail damaged wine grapes in Mendoza but table grapes were in better condition in this province in March. Crop prospects were good in San Juan and in the Río Negro territory. Gathering of table grapes was well advanced in La Rioja and Catamarca and yields were good.

Algeria: Weather conditions in March were favourable for vines, except in the first ten days when there was some frost. First growth took place in satisfactory conditions and it was estimated at the beginning of April that the wines were about a fortnight in advance of normal (*Moniteur Vinicole*).

See the table of supplementary area and production figures on page 288.

CURRENT INFORMATION ON OLIVES.

Greece: Olive pruning was carried out during March in spite of the bad weather of the first three weeks of the month. Growers and co-operatives are busy with the grafting of wild olives, manuring and other seasonal work.

Argentina: Trees were in normal condition in March in La Rioja and Catamarca but hail had caused damage in Mendoza.

See the table of supplementary area and production figures on page 288.

CURRENT INFORMATION ON FLAX.

Hungary: At the beginning of April, it had not yet been possible to sow spring flax.

United Kingdom: A large increase in the acreage of flax for linseed is anticipated this season. A market has been guaranteed by the Government to farmers, who will

be entitled to receive, in return for every ton of linseed supplied to the Ministry of Food, 10 cwt. of linseed cake. Prices will be fixed later in the season on the basis of imported linseed prices.

United States The prospective 1940 linseed area of 2,836,000 acres, estimated by the Crop Reporting Board on the basis of farmers' intentions on March 1, is 14.8 per cent. greater than last year's seeded acreage and 58.6 per cent. above the five-year (1934-38) average. The expansion of the linseed acreage in the older growing areas this year is due to the continuation of the favourable provisions under the Agricultural Conservation Program, good yields last year in the important flax States and the present favourable linseed prices.

With an abandonment about equal to the average of the years 1929 to 1938, excluding the severe drought years of 1934 and 1936, the acreage to be harvested would be about 2,475,000 acres.

Egypt According to the most recent estimate the area cultivated to flax this year amounts to 10,200 acres against 9,990 in 1939 and 6,300 on the average of the five years ending 1938, percentages, 102.2 and 161.7. The production of the 1939 crop is estimated at 81,500 centals of fibre and 58,300 centals of linseed (104,000 bushels) against 43,500 centals of fibre and 45,200 centals of linseed (80,600 bushels) on the average of the five years ending 1938.

CURRENT INFORMATION ON COTTON.

Greece. The Government having decided on a further increase in cotton production, a special Conference was held under the Presidency of the Prime Minister, with the participation of the Ministers of Agriculture and of National Economy, the Representatives of the Cotton Institute and the Governor of the National Bank. According to the detailed Report of the Ministry of Agriculture on the present situation of Greek cotton production, it was decided that cultivation will shortly be extended in order that internal requirements may be fully supplied, even if the area of other crops, such as maize, has to be correspondingly reduced. Following the unfavourable weather of the first three weeks of March, the fine and warmer weather of the last ten days were favourable for the beginning of operations in preparation for cotton sowing.

Yugoslavia The recent rise in cotton prices on the world market has encouraged the growers of southern Serbia, where conditions are most favourable for cultivation, to increase the area under cotton, particularly in view of the fact that Yugoslav cotton production covers barely 2 per cent. of the requirements of her textile industry.

U. S. S. R. According to the report of the Commissariat for Agriculture, the area sown to cotton on April 5 on Kolkhozi in Central Asia and Transcaucasia was 108,900 acres, or 2 per cent. of the Plan, against 248,800, on 5.4 per cent. of the Plan, at the same date last year. In 1938, according to the Plan, the area under cotton in Kolkhozi in the Union as a whole amounted to only about 4 per cent. of the total.

In most parts of the cotton areas of Central Asia and Transcaucasia, the weather in the last decade of March and in the first few days of April was warm and on the whole favourable for sowings.

United States At the middle of March weather conditions in the Southern cotton belt became more favourable for farm work but preparations were still generally backward. At the beginning of April planting of cotton had made a considerable advance in Central Texas. Planting had also begun in Georgia, Southern Alabama, the coastal

regions of South Carolina, the South-central part of New Mexico, and in California Elsewhere in the cotton belt soil preparations continue.

India: According to the supplementary estimate, the area cultivated to cotton in Madras this year was 1,780,000 acres against 1,958,000 acres in 1938-39 and an average of 2,430,000 acres in the five years ending 1937-38, percentages, 90.9 and 73.3. The corresponding production is estimated at about 1,467,000 centals (306,900 bales of 478 lb.) against 1,556,000 centals (325,400 bales) and 1,982,000 centals (414,700 bales), percentages, 94.3 and 74.0.

Egypt: In spite of the unsettled weather during part of March, sowing proceeded actively during the month. It is completed in the south of the Delta, where 95 per cent. of the area had been sown at the beginning of April. Sowing is also finished in Upper Egypt, with the exception of the provinces of Fayum and Girga. The weather conditions have resulted in late germination and slow growth. Resowing is now proceeding, to an extent not exceeding 5 per cent., while in some parts of Lower Egypt the percentage amounted to 15 per cent. of the area cultivated at the beginning of March. Sowing is being completed on the remaining area and also hoeing, re-sowing and irrigation on early crops and some main-season crops. In addition the thinning of a small proportion of fields has begun among the early crops of the South of the Delta and of Upper Egypt.

In the opinion of commercial circles, the area sown to cotton this year is 5 to 10 per cent. larger than last year, which was one of the smallest areas of the last decade.

Cotton ginned up to the end of February, in bales of 478 lb. net weight was as follows:—

Varieties	1940	1939	1938	1937	1936	1935	1934
Giza 7	493,718	356,702	458,548	381,738	248,949	182,100	89,354
Sakellaridis	41,396	51,309	85,167	103,868	176,883	182,823	222,945
Other varieties above:							
1 1/8"	88,032	87,047	102,652	91,205	94,320	49,827	105,108
1 3/8"	76,335	41,690	29,734	30,111	40,881	39,488	71,323
1 1/2"	963,596	966,855	1,227,484	1,210,210	1,073,784	985,377	1,121,705
Total	1,663,077	1,503,603	1,903,565	1,819,132	1,634,817	1,439,615	1,610,735
Scario	31,628	30,593	32,912	40,797	36,497	30,915	31,745
Total production (including Scario)	1,815,221	1,728,090	2,281,223	1,887,164	1,768,581	1,565,583	1,776,908

* Second estimate.

Uganda: It was reported in February that some loss of crop had occurred owing to heavy rain interfering with the picking of late planted cotton. Marketing had been hindered by the wet weather but it was considered that there still remained a substantial proportion of the Buganda crop to be sold.

See the table of supplementary area and production figures on page 288

CURRENT INFORMATION ON HEMP.

Yugoslavia: The favourable situation of hemp fibre on the world market has encouraged growers to devote a larger attention to this crop and to increase the area. In fact, according to recent unofficial reports, this year's hemp acreage will be much larger than last year's.

U S S R.: According to the Plan the total area destined for hemp cultivation in the South and North of the Union is 1,530,000 acres, against 1,350,000 acres in 1939 and an average of 1,490,000 in the preceding five years: percentages, 113.1 and 103.2

Preparations for the coming season are making rather slow progress. Up to the middle of March the quantity of seed distributed represented only 52 per cent. of the total forecast by the Plan. It is affirmed, however, that the quantity necessary for sowing the area forecast by the Plan is available. It is only necessary to organize a more rapid distribution in areas which require it.

Argentina: Hemp crops were in normal condition at the middle of March and promised a better production of fibre than last year's, especially from the standpoint of quality

CURRENT INFORMATION ON TOBACCO.

France: Seasonal conditions in 1939 were favourable for tobacco cultivation. A few attacks of rust were the only damage reported. Quality is considered better than normal.

Greece: The improvement of the weather in the last ten days of March was favourable for preparations for tobacco planting.

Argentina: Harvesting was proceeding in the main growing areas with generally good yields.

Union of South Africa: Irrigated tobacco crops were doing well in Transvaal in February in spite of drought, but sunburn caused severe damage on dry lands.

See the table of supplementary area and production figures on page 288.

CURRENT INFORMATION ON HOPS.

Yugoslavia: A recent decree of the Ministry of Finance grants powers to the Ministry of Agriculture to control, by means of special orders, hops production and trade. The State Monopoly which controls hops differs considerably from that controlling other monopolized agricultural products, but is almost identical with that regulating opium. By this Decree of the Ministry of Finance, the Minister of Agriculture has power, after preliminary consultation with the hops co-operatives, to enlarge or reduce the area under hops. Hops cultivation is forbidden on unsuitable land or on land not ordinarily cultivated under hops. The sowing of hops without previous authorization from the Government is also forbidden under penalty of heavy fines and the destruction of the hops cultivated.

The decree also obliges growers to pay to the hops co-operatives 1 per cent. of the market price obtained. The fund obtained from this source constitutes a reserve for controlling the price of hops.

CURRENT INFORMATION ON OTHER PRODUCTS:

Tea.

U. S. S. R.: According to the Plan, the area to be cultivated to tea this year will be 139,600 acres, against 125,000 in 1939 and a preceding five-year average of 98,800; percentages, 111.7 and 141.3.

Coffee.

Brazil: The total quantity of coffee destroyed in Brazil from 1931 to the end of February 1940 amounts to 90,700,000 centals, of which 146,000 were eliminated in February. According to the "Departamento Nacional do Café", exportable stocks in Brazilian ports on March 31, 1940 amounted to 3,997,000 centals, of which 2,637,000 were in the port of Santos and 763,000 in Rio de Janeiro

Nicaragua: The 1939-40 coffee crop is officially estimated at 353,000 centals, of which 265,000 represents the exportable surplus, against 273,000 actually exported in 1938-39. Yields this season were reduced by drought and the ravages of insects.

Venezuela: February was generally dry and on the whole favourable for coffee crops. The official report of March confirms, for the 1939-40 season, a large coffee production, which would leave an exportable surplus of 1,140,000 centals

Angola: Coffee picking in the 1939-40 season gave average results which remained below those of last season.

Sierra Leone: The February report confirms an average coffee crop this season

Hawaii: The condition of coffee plantations on March 1 was considered very precarious owing to the unfavourable weather of January and February

Groundnuts.

Argentina: Harvesting of groundnuts was proceeding in March in Santa Fe and Entre Ríos with good unit yields. Crop condition continued good elsewhere:

Netherlands Indies, Java and Madura — The Department of Agricultural Statistics of the Central Statistical Office communicates the following details of the groundnut area —

	1940 acres	1939 acres
Area harvested in January	35,100	37,600
Area of standing crops at the end of January .	157,400	148,000
Area harvested in February	41,800	46,500
Area harvested from January 1 to February 29.	76,600	84,000
Area of standing crops at the end of February. .	151,700	131,000

Colza and Sesame.

Hungary: Winter colza, in fields not covered by snow, suffered very severe damage from frosts in January. On low-lying land the crops are under water.

See the table of supplementary area and production figures on page 288.

Supplementary Area and Production Figures.

As the 1939 or 1939-40 figures of area and production for most countries were published in the March number of the Monthly Crop Report and Agricultural Statistics, it is not necessary to repeat them again this month. Hence only new data and any modifications of the figures published last month are given in continuation. In another table is shown the total world production based on the figures received up to the time of going to press.

COUNTRIES	AREA						PRODUCTION									
	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40		1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40				
				1938 and 1938-39	Aver. = 100							1938 and 1938-39	Aver. = 100			
ooo acres						ooo centals			ooo bushels							
BULGARIA																
Cotton (ginned) .	117	136	93	86.3	126.7	227	153	164	(¹) 48	(¹) 32	(¹) 34	148.5	138.8			
Sericulture . . .	(¹) 43	(¹) 38	(¹) 28	114.8	154.2	(¹) 5,244	(¹) 4,803	(¹) 3,189	(¹) 5,244	(¹) 4,803	(¹) 3,189	109.2	164.5			
FRANCE																
Tobacco	45	45	45	99.8	99.0	(¹) 74,076	(¹) 73,119	(¹) 76,544	(¹) 74,076	(¹) 73,119	(¹) 76,544	101.3	96.8			
LATVIA																
Wheat	378	348	333	108.6	113.7	4,664	4,231	3,944	7,774	7,052	6,574	110.2	118.3			
Rye	737	709	664	104.0	111.1	9,876	8,349	8,105	17,636	14,909	14,474	118.3	121.8			
Meslin	223	195	181	114.6	123.6	2,939	2,657	2,188	5,067	4,581	3,773	110.6	134.3			
Barley	445	440	459	101.3	97.0	4,900	4,863	4,413	10,209	10,131	9,193	100.8	111.1			
Oats	935	860	798	108.8	117.2	10,689	9,846	7,913	33,402	30,769	24,727	108.6	135.1			
Potatoes	359	340	288	105.5	124.7	36,158	38,611	33,964	60,262	64,350	56,606	93.6	106.5			
LUXEMBURG																
Wheat	42	57	41	74.0	101.1	567	1,098	656	945	1,830	1,093	51.6	86.4			
Rye	19	18	19	108.1	103.1	286	284	271	510	507	483	100.7	105.6			
Meslin	3	4	6	65.8	42.6	38	68	92	65	117	159	55.5	40.7			
Barley	8	5	6	173.0	137.3	118	67	78	246	140	162	175.9	151.5			
Oats	67	61	66	109.9	102.4	1,061	916	963	3,314	2,864	3,011	115.7	110.1			
Potatoes	43	43	41	100.6	104.3	5,683	6,296	3,982	9,472	10,492	6,636	90.3	142.7			
PORTUGAL																
Rye	311	331	365	93.9	85.2	2,270	2,269	2,299	4,054	4,051	4,105	100.1	98.8			
Barley	158	186	173	85.2	91.3	864	860	872	1,800	1,791	1,816	100.5	99.1			
Oats	601	618	527	97.2	114.2	2,158	2,090	1,954	6,743	6,530	6,106	103.3	110.4			
Wine (Continent) .	—	—	—	—	—	(¹) 169,767	(¹) 240,985	(¹) 165,806	(¹) 203,875	(¹) 289,402	(¹) 199,118	70.4	102.4			
UNITED STATES																
Sugar beet . . .	917	930	809	98.6	113.3	215,460	232,300	177,076	(¹) 10,773	(¹) 11,615	(¹) 8,854	92.8	121.7			
Beet sugar (raw) .	—	—	—	—	—	35,118	36,059	28,158	(¹) 1,756	(¹) 1,803	(¹) 1,408	97.4	124.7			
Sugar cane (for sugar)	258	294	243	87.7	106.0	115,960	134,820	89,424	(¹) 5,798	(¹) 6,741	(¹) 4,471	86.0	129.7			
CYPRUS																
Wheat	195	191	180	101.6	108.2	1,506	1,210	1,246	2,510	2,017	2,077	124.5	120.9			
Barley	121	115	113	105.1	107.2	1,084	913	938	2,259	1,902	1,954	118.7	115.6			
Oats	15	14	12	109.0	129.2	101	89	71	316	277	222	114.3	142.5			
Potatoes	7	6	6	118.0	122.3	690	504	479	1,150	840	799	136.8	143.9			
Fresh grapes . . .	126	125	121	100.8	103.8	926	1,408	1,062	(¹) 92,594	(¹) 40,821	(¹) 106,191	65.8	87.2			
Wine	—	—	—	—	—	(¹) 3,473	(¹) 4,993	(¹) 2,844	(¹) 4,171	(¹) 5,996	(¹) 3,416	69.6	122.1			
Olives	—	—	—	—	—	109	186	173	(¹) 10,896	(¹) 18,552	(¹) 17,281	58.7	63.1			
Olive-oil	—	—	—	—	—	16	26	31	(¹) 213	(¹) 345	(¹) 416	61.7	51.1			
Sericulture . . .	(¹) 2	(¹) 2	(¹) 2	93.9	130.7	(¹) 304	(¹) 331	(¹) 295	(¹) 304	(¹) 331	(¹) 295	91.9	103.2			
CHOSEN																
Tobacco	52	48	40	106.7	130.1	(¹) 74,897	(¹) 64,543	(¹) 44,619	(¹) 74,897	(¹) 64,543	(¹) 44,619	116.0	167.9			

COUNTRIES	AREA						PRODUCTION							
	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40		1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	1939 and 1939-40	1938 and 1938-39	Average 1933 to 1937 and 1933-34 to 1937-38	% 1939 and 1939-40		
				1938 and 1938-39	Aver = 100							1938 and 1938-39	Aver = 100	
ooo acres				ooo centals				ooo bushels						
INDIA														
Cotton (ginned)	21,356	23,482	24,631	90.9	86.7	19,768	20,304	22,140 (1)	4,136 (1)	4,248 (1)	4,632	97.4	89.3	
Sesame	4,100	4,331	4,247	94.7	96.5	9,296	8,870	9,610 (1)	465 (1)	444 (1)	480	104.8	96.7	
TURKEY														
Tobacco	198	208	167	95.2	118.5	(*)24,562	(*)17,267	(*)10,141	(*)24,562	(*)17,267	(*)10,141	106.2	113.1	
A-E. SUDAN														
Cotton (ginned)	426	458	402	93.1	106.2	1,127	1,258	1,077 (1)	236 (1)	263 (1)	225	89.6	104.6	
ARGENTINA														
Cotton (ginned)	903	1,005	832	89.8	108.5	1,773	1,563	1,195 (1)	371 (1)	327 (1)	250	113.4	148.4	
URUGUAY														
Rice	14	14	10	106.5	151.8	489	472	291	1,086	1,050	646	103.4	168.1	
MAURITIUS														
Cane sugar	—	—	—	—	—	5,059	7,084	5,886 (1)	254 (1)	354 (1)	294	71.4	85.9	
UNION OF SOUTH AFRICA														
Barley (Cult by Europ)	...	...	74	...	...	453	...	626	943	..	1,303	...	72.3
Oats (Cult by Eu rop)	..	...	503	...	...	1,779	...	2,165	5,559	...	6,765	...	82.2
NEW ZEALAND														
Wheat	...	189	234	...	...	5,400	3,338	4,445	9,000	5,564	7,408	161.8	121.5

(1) Thousand bales of 478 lb. — (2) Thousand ounces of silkworm eggs — (3) Thousand pounds of cocoons. — (4) Thousand pounds — (5) Thousand Imperial gallons — (6) Thousand American gallons. — (7) Thousand short tons.

World Totals of Agricultural Products.

The following totals have been obtained from the data in the tables published for each product in March, which have been revised and completed. With the name of each product is indicated the number of countries, for which data for 1939 are at present available and also the percentage of their total average production in respect to the average world production in 1933 to 1937 as shown in the *International Yearbook of Agricultural Statistics* 1938-39 in which nearly all producing countries appear. The data for the U S S R. and China are not included.

CROPS	AREA						PRODUCTION							
	1939 — 1939 40	1938 — 1938 39	Average 1933 to 1937 — 1933 34 to 1937 38	1939 — 1939 40		Average 1933 to 1937 — 1933 34 to 1937 38	1939 — 1939 40	1938 — 1938 39	Average 1933 to 1937 — 1933 34 to 1937 38	1939 — 1939 40	1938 — 1938 39	Average 1933 to 1937 — 1933 34 to 1937 38	1939 % — 1939-40	
				1938 — 1938- 1939 = 100	Aver age = 100								1938 — 1938- 1939 = 100	Aver age = 100
000 acres														
Wheat (42 countries, 85 %)	234 383	251 723	223 016	93 1	105 1	2 217,688	2,369,276	1 847,667	3,696,073	3,948,715	3,079 384	93 6	120 0	
Rye (26 countries, 90 %)	44,354	44,502	42,928	99 7	103 3	544 971	545 941	483,495	973,166	974 898	863,387	99 8	112 7	
Barley (37 countries, 78 %)	57 431	54,465	53 462	105 4	107 4	678 429	628 827	552 070	1,413,418	1,310 079	1,150,167	107 9	122 9	
Oats (32 countries 82 %)	77 498	79,997	80,192	96 9	96 6	888,349	923,579	811,919	2,776 071	2,886 164	2,537 229	96 2	109 4	
Maize (12 countries, 77 %)	138 612	137,045	140,826	101 1	98 4	2,113,234	1,978,118	1 723,628	3 773,634	3,532,354	3,077 908	106 8	122 6	
Rice (rough) (12 coun- tries, 79 %) (1)	109,389	111,970	108 258	97 7	101 0	1,581,800	1,570,913	1,568,596	3,515,048	3,490,857	3,485 703	100 7	100 8	
Potatoes (24 coun- tries, 55 %) . . .	16,566	16 682	16,756	99 3	98 9	2,125,991	2,123,603	1,985,990	3 543,247	3,539,268	3,309,918	100 1	107 0	
Thousand short tons														
Sugar beet (14 coun- tries, 64 %) (1) .	6,131	6 054	7,634	101 3	108 8	1,283,831	1,175,147	991,565	64,191	58,757	49,578	109 2	129 5	
Thousand bales of 478 lb.														
Cotton (ginned) (13 countries, 85 %) (1)	63,220	65,620	69,969	96 3	90 4	119,775	120,018	119,185	25,058	25,108	24,934	99 8	100 5	
Thousand bushels														
Linseed (12 countries, 95 %) . . .	15,212	12,650	13,332	120 3	114 1	52,294	51,150	55,874	93,382	91,339	99,776	102 2	93 6	
Thousand pounds														
Flax (fibre) (9 coun- tries, 84 %) (1)	—	—	—	—	—	16,411	14,244	13,865	1,641,127	1,424,411	1,386,492	115 2	118 4	
Tobacco (17 countries, 75 %)	4,517	3,909	3,702	115 5	122 0	(2) 4,078,916	(2) 3,341,626	(2) 3,359,995	4,078,916	3,341,626	3,359,995	122 1	121 4	
Thousand American gallons														
Olive oil (3) .	—	—	—	—	—	22,179	16,072	19,202	295,714	214,289	256,030	138 0	115 3	
Thousand pounds (5)														
Silk (3) (4) . . .	—	—	—	—	—	914,921	816,154	916,906	914,921	816,154	916,906	112 1	99 8	

(1) Including U. S. S. R. — (2) Thousand pounds. — (3) Approximate world production. — (4) Not including China and India
— (5) Cocoons

CURRENT INFORMATION ON FODDER CROPS.

Belgium. The data of production of fodder crops in 1939, compared with the figures for 1938 and the average for the preceding five years, are as follows —

	1939	1938	Average 1933-37	1939	1938	Average 1933-37	$\frac{1938}{1939} \times 100$	$\frac{1938}{\text{Average}} \times 100$
	ooo centals			ooo short tons				
Mangels	120,374	101,331	124,777	6,019	5,066	6,239	118.8	96.5
Carrots, main crop .	766	738	673	38	37	34	103.9	113.8
Turnips and swedes, main crop	3,640	3,654	4,017	182	183	201	99.6	90.6
Crimson clover (1) .	3,123	4,198	4,012	156	210	201	74.4	77.8
Red clover (2) . . .	4,056	6,094	8,172	203	305	409	66.6	49.6
Other clover (2) . .	1,011	1,358	1,606	51	67	80	74.5	63.0
Alfalfa (2)	1,067	1,121	1,305	53	56	65	95.2	81.8
Sainfoin ()	263	273	351	13	14	18	96.3	74.8
Meadow-hay, mown (2)	19,257	23,121	22,307	963	1,156	1,115	83.3	86.3
Rye-grass and timo- thy (2)	1,004	1,076	979	50	54	49	93.3	102.6
Turnips (catch crop) .	56,492	48,012	57,691	2,825	2,401	2,885	117.7	97.9
Carrots (catch crop) .	1,156	950	1,552	58	48	76	121.7	74.5
Spurry (catch crop) .	1,630	1,752	2,405	82	88	120	93.0	67.8

(1) Green feed — (2) Hay

Hungary. The condition of rotation meadows varies greatly from one district to another. Crops have on the whole wintered fairly well, but there are complaints of serious damage by field mice, frost and floods. Meadows and pastures on low-lying ground are flooded, while on higher land they are becoming verdant.

Ireland. The first and last ten days of March were dry and cold, while rain was general in the middle of the month. Supplies of hay, roots and concentrated feeds were sufficient to last out the season.

Switzerland. Permanent and rotation meadows are in fair condition, although they have suffered to some extent from the wet weather of the autumn and the severe winter. The growth of the grass, however, is still retarded. In some parts rotation meadows show damage due to the frosts. Crop condition on April 1, in the system of the country, was 75 for rotation meadows (against 81 on April 1 1939 and 1938) and 78 for permanent meadows (against 81 and 80 on April 1, 1939 and 1938 respectively).

Argentina. Ploughing proceeded in March actively in all the cereal regions in preparation for the sowings of oats and rye for grazing livestock during the winter. Weather conditions were very favourable for seasonal operations. The harvesting of alfalfa meadows gave better than normal yields. The condition of other rotation meadows was good, except in the southwest of Buenos Aires Province.

United States: The Crop Reporting Board in its survey of farmers' intentions on March 1 estimates that approximately 59,385,000 acres of tame hay will be cut in 1940. This would be 1.8 per cent. more than the 58,347,000 acres cut in 1939 and 5.9 per cent. more than the average area of the five years 1934 to 1938 (56,100,000 acres).

The tendency towards moderate increase in hay acreage is rather general, though the prospective 1940 acreage is less than that cut in 1939 in a few Northwestern States and in parts of the Cotton Belt. Small increases are expected elsewhere, except in half a dozen Maize Belt States where reductions in the acreage of maize are reflected in prospective increases in tame hay ranging from 6 to 8 per cent. There will be a large acreage of crops which might be cut for hay in 1940, but with yields per acre and the eventual utilization of most of such crops still uncertain, the present estimate is indicative only of the general tendency towards increased forage production.

Egypt. The third cutting of clover is proceeding generally. The fourth cutting has begun in certain districts. Growth in Lower Egypt is generally below average. Maturation is progressing on irrigated lands left for the production of seed for sowing in Upper Egypt and harvesting has begun, condition is satisfactory. Crop condition on April 1 was 99, as on March 1, against 102 on April 1, 1939.

LIVESTOCK AND DERIVATIVES

LIVESTOCK IN BELGIUM.

In the following table are given the numbers of livestock in Belgium on 31 December 1939 compared with the figures of preceding years and the pre-war period:

YEAR	HORSES (1)			CATTLE				PIGS			
	under 3 years	over 3 years	Total	under 2 years	dairy cows	other cattle over 2 years	Total	under 6 months	over 6 months	of which store pigs (fatten- ing)	Total
1939 . . .	79,718	165,831	245,549	636,266	885,853	77,718	1,599,837	409,642	446,286	330,285	855,928
1938 . . .	78,866	185,784	264,650	646,719	965,699	77,262	1,689,680	467,235	493,137	362,557	960,372
1937 . . .	77,231	187,233	264,464	663,212	971,627	75,198	1,710,037	413,460	458,096	337,175	871,556
1936 . . .	75,518	187,586	263,104	589,078	983,983	79,738	1,782,840	506,987	547,486	704,805	1,054,475
1935 . . .	91,112	140,294	231,406	763,064	970,225	104,205	1,837,494	712,139	572,326	428,261	1,284,465
1934 . . .	91,199	140,600	231,799	762,334	963,030	114,317	1,839,681	688,684	569,174	422,485	1,257,858
1933 . . .	91,442	141,847	233,289	760,609	946,515	105,483	1,812,607	729,168	623,358	461,345	1,352,526
1932 . . .	95,079	142,933	238,012	745,752	941,814	96,880	1,784,446	679,424	565,230	421,322	1,244,654
1931 . . .	96,663	145,326	241,989	738,740	930,930	97,866	1,767,536	672,902	562,312	420,114	1,235,214
1930 . . .	98,184	147,787	245,971	732,437	925,556	100,661	1,758,654	680,867	568,754	424,066	1,249,621
1913 . . .	95,472	171,688	267,160	779,950	936,800	132,734	1,849,484	746,674	665,619	—	1,412,293

(1) Horses used in agriculture

LIVESTOCK SLAUGHTERINGS IN ROMANIA.

The numbers of livestock slaughtered in urban and rural slaughter-houses; excluding those carried out by the military authorities, were as follows in 1939 and 1938:

Classification	1939	1938	Classification	1939	1938
Bulls	9,375	8,052	Sheep	357,823	340,605
Oxen	148,889	128,411	Lambs	1,075,312	1,125,939
Cows	239,382	202,234	<i>Total sheep</i> . . .	<i>1,433,135</i>	<i>1,466,544</i>
Young oxen . . .	111,935	106,670	Goats	24,930	33,967
Heifers	110,241	105,907	Pigs	845,242	773,304
Calves	345,500	305,520	Young pigs . . .	8,397	21,883
<i>Total cattle</i> . . .	<i>965,322</i>	<i>916,791</i>	<i>Total pigs</i>	<i>853,639</i>	<i>795,247</i>
Buffaloes	33,862	32,493	Horses	280	385

LIVESTOCK IN CANADA.

The following table shows the numbers of livestock on farms in Canada on June 1 and December 1 of the years 1931 to 1939. These figures have been taken from a report issued by the Dominion Bureau of Statistics on March 13, 1940.

*Numbers of Livestock on Farms in Canada, June 1
and December 1, 1931 to 1939.*

(000's)

YEARS	CATTLE		SHEEP		PIGS		BIRDS AND CHICKENS	
	June 1	Dec 1	June 1	Dec 1	June 1	Dec 1	June 1	Dec 1
1939	8,474	8,224	3,366	2,653	4,294	4,768	58,510	43,527
1938	8,511	8,091	3,415	2,672	3,487	3,569	53,775	40,753
1937	8,840	8,080	3,340	2,674	3,963	3,680	53,983	39,564
1936	8,841	8,337	3,327	2,626	4,145	4,422	55,769	43,492
1935	8,897	8,499	3,399	2,628	3,549	3,951	53,063	44,199
1934	9,012	8,539	3,421	2,738	3,654	3,649	55,430	46,487
1933	8,917	8,503	3,386	2,738	3,801	3,588	54,943	46,643
1932	8,530	8,092	3,644	2,812	4,639	4,125	59,843	49,226
1931	7,973	7,864	3,627	2,762	4,700	4,264	61,277	50,615

Numbers of cattle on farms at December 1, 1939 were estimated at 8,224,100, an increase of 1.6 per cent. over the total at December 1, 1938. Numbers of cattle on farms declined sharply from the peak reached in 1934 to a low point in 1937. Although there was a very slight increase in December 1938, the 1939 increase provides a more definite indication of the reversal of the downward trend in the cattle population. Numbers at June 1, 1939 were slightly below those of 1938, but, in view of the increase in numbers at December 1 1939, the June 1940 figures are expected to continue the rising trend.

While total numbers of cattle at December 1, 1939 were higher than at the same date a year ago, the numbers of milk cows dropped slightly from 3,961,300 to 3,933,300.

The numbers of cattle intended for farm slaughter and market in the period December 1939 to May 1940 were estimated at 1,405,800 head, an increase of 3.3 per cent. on the same period in 1938-39. The number of cows expected to calve in the same period was 3,331,900, an increase 1.0 per cent. on the preceding year.

* * *

A slight decline was shown in the number of sheep on farms at December 1 1939 as compared with the sheep population at December 1, 1938. Numbers of sheep on December 1 have declined in the past two years and at Decembers 1939 were the lowest recorded since the December survey was commenced in 1931 except in 1935 and 1936.

The number of sheep intended for farm slaughter and market during the six months December 1939 to May 1940, at 368,100, showed a decline of 5.4 per cent. from the intentions for the corresponding period in 1938-39.

The numbers of pigs on farms on December 1, 1939 totalled 4,769,600, an increase of 33.7 per cent. on the number at December 1, 1938. Not only is this the largest number recorded since the December surveys were instituted in 1931, but it also exceeds the numbers recorded at June 1 with the exception of 1934. This situation is more significant because normally June numbers are higher than those in December.

The fall pig crop of 1939 was 4,432,300 of which 3,725,600 were saved. This crop exceeded expectations and was 33.0 per cent. larger than the fall crop of 1938.

The number of hogs intended for farm slaughter and for market in the period December 1939 to May 1940 was estimated at 2,905,300 head, an increase of 40.3 per cent. on the intentions for the same period in 1938-39.

The spring crop of 1940, based on the number of sows expected to farrow, will be 35 per cent. greater than the spring pig crop of 1938. There will thus be increased marketings also in the late summer and throughout the autumn of 1940.

The increase in pig production commenced in the summer of 1938 as a result of adequate feed supplies and relatively favourable pig prices. For the same reasons, there were further increases in production in 1939. Additional incentive was provided by the outbreak of war in September and the prospective increases in demand for bacon which war conditions would bring.

The numbers of hens and chickens on farms at December 1, 1939 were 6.8 per cent. higher than in 1938 and at the highest level since 1935. The turkey population was estimated at 2,641,800 against 2,241,100 on December 1, 1938, an increase of 17.9 per cent.

THE WOOL CLIP OF CANADA.

According to the final official estimate, the total production of shorn and pulled wool, in Canada in 1939 was 17,888,000 lb. of which 13,611,000 lb. were shorn wool. This compares with a total production of 17,695,000 lb. in 1938 and 17,629,000 lb. in 1937. An increase of 4.4 per cent. in the number of sheep to be shorn in 1940 is forecast.

MILK PRODUCTION IN THE UNITED STATES.

The quantity of milk produced on farms in the United States in 1939 is officially estimated to have reached 108,558 million lb. This represents an increase of 1.2 per cent. on the production of 1938 which was 107,255 million lb. These figures exclude milk sucked by calves and milk produced by cows not on farms. The annual milk production per cow in 1939 was 4,538 lb. against 4,522 lb. in 1938.

Regionally, the increase in milk production over 1938 was most pronounced in the central and northern Great Plains and eastern Rocky Mountains areas where restocking of milking herds has been apparent and where heavy production per cow has been encouraged by supplementary feeding which offset, to a large extent, an only fair pasture season in 1939. In the States from Idaho, Montana, and North Dakota to Arizona, New Mexico, and Kansas, milk production in 1939 was up from 2 to 9 per cent. as compared with 1938.

In the Northeast, where many important dairy areas suffered from drought last summer, milking herds were increased only slightly and milk production was generally not far from that in 1938. In the eastern and central Corn Belt States, milk cow numbers in 1939 were only slightly above those in 1938, but a generally favourable season with ample feed supplies resulted in moderate increases in milk production per cow and total milk production. In Michigan increases in both milk cows and production per cow resulted in milk production in 1939 nearly 4 per cent. above that in 1938, while in Wisconsin an increase in cow numbers was partially offset by some decline in milk production per cow.

In the South, most States east of the Mississippi River showed moderately higher milk production in 1939 than in 1938, but West Virginia, Kentucky and Mississippi showed a decline, and west of the Mississippi River, milk production ranged from no change to a 4 per cent. decline in Texas. On the Pacific coast milk production was up slightly, with the most pronounced change in Washington.

BUTTER PRODUCTION, TRADE AND PRICES IN 1939.

Production.

Weather conditions, which are a vital factor in milk and butter production, were rather irregular in Europe in 1939. Conditions were very abnormal in certain areas and were widely variable between one section and another, but

do not appear to have been too unfavourable on the whole. In any case fodder production was good.

In the United States the weather, particularly in the first part of the year, was favourable for milk production. Reports from South America were on the whole good. In Australia also conditions were on the whole favourable for milk production.

On the aggregate, butter production in 1939 seems to have exceeded the average. Since the beginning of the war, however, some falling off may be noted as a result of the difficulties imposed on the economic life and the mobilization of agricultural labour, even in the countries not directly involved in the hostilities.

Statistics of 1939 production are very incomplete, and many figures are still lacking even for 1938. These missing data will be filled in as far as possible in our 1939-40 International Yearbook of Agricultural Statistics, in which the table of butter production will appear for the first time.

In the largest producing country, the United States, production was smaller than that of 1938, which was a record. The 1939 outturn, however, was one of the largest, being only very little short of the second highest figure—that of 1933.

For Germany the Central Association of the Milk and Fat Industry (Hauptvereinigung der Deutschen Milch- und Fettwirtschaft) gives a factory butter production for the period from January to September, 1939 of 755,700,000 lb. This figure is not inserted in the table since the statistics of the Central Association do not exactly coincide with the figures of the Reich Statistical Office, which are generally adopted. Production in the corresponding periods of 1937 and 1938 were 714,000,000 lb. There was thus a considerable increase during the period preceding the war. Since the beginning of the war butter production was greatly increased by the fact that the consumption of fresh milk was largely replaced by the consumption of skimmed milk. It is officially stated that the butter produced from the cream thus obtained corresponds approximately to the quantity formerly imported. This would bring production up to roughly 1,000,000,000 lb. As regards farm butter, there is reason to believe that the decline which has taken place for a number of years is continuing. At the beginning of the war butter consumption was rationed. The ration for four weeks (excluding margarine and other fats) was raised progressively from 13 oz. per normal consumer to 20 oz. For certain classes of people the ration was higher, *e.g.* 26 oz. for children.

The estimate of 1939 production in the Netherlands is 16,200,000 lb. larger than the corresponding figure of 1938 and is the largest on record.

It appears from the Soviet press that 75 per cent. of the Plan for butter production in 1939 was realized. Apparently production is not sufficient to cover fully internal requirements. The Soviet Union, which two years ago was a medium exporting country, may now become, after a heavy reduction in exports in 1938, a butter importing country. In fact, during recent commercial negotiations it showed a keener interest in Estonian butter.

The figures for Australia and New Zealand refer to commercial years. In both cases the 1938-39 production exceeded that of 1937-38. While, however,

Production of Butter.

(ooo lb.)

COUNTRIES	1931 1938 31	1938 1937 38	1937 1936 37	1936 1935 36	1935 1934 35	1934 1933 34	1933 1932 33	1932 1931 32
Albania		2 646	—	2 866	3 086	2 866	—	—
Germany	{ a) (*)	905 662	919 771	845 696	687 845	621 485	558 653	494 939
	{ b)	212 747	229 502	248 021	308 648	374 787	429 903	429 903
	{ Total	1 118 409	1 149 273	1 093 717	996 493	996 272	988 556	924 842
Austria	—	(1)	49 604	(1)	49 604	(1)	48 502	—
Belgium	134 482	141 317	138 892	143 300	136 687	148 592	153 883	142 419
Bulgaria		1 543	1 323	1 323	1 323	882	—	—
Denmark		417 557	404 329	396 613	381 621	402 565	407 857	416 234
Spain							15 653	—
Estonia	a)	38 581	35 054	30 424	29 322	27 778	—	—
Finland	a)	73 194	65 478	61 289	52 691	53 793	52 470	57 100
France			458 122	—	473 995	—	—	—
Greece	c)	9 727	13 228	13 228	12 566	13 448	13 669	7 937
Hungary	a)	22 267	24 912	22 046	18 078	20 724	18 078	13 669
Ireland		42,770	137 348	142 199	181 221	—	—	—
Italy	a)		85 099	—	—	—	—	—
Latvia	a) d)	57 320	47 840	42 329	39 904	36 376	36 597	44 313
Lithuania	f) ()	44 093 ()	43 211	37 479	34 833	29 101	23 590	21 826
Luxembourg	{ f)	5 291	5 512	5 732	5 512	5 512	—	—
	{ g)		3 086	1 543	1 323	661	—	—
	{ Total		8 598	7 275	6 835	6 173	—	—
Norway		38 801	32 408	26 676	25 133	20 503	20 283	19 401
Netherlands	{ d)	224 205	208 999	208 111	207 456	198 637	181 662	176 150
	{ e)	14 663	13 669	13 889	15 873	13 448	17 858	18 078
	{ Total	238 868	222 668	222 006	223 329	212 085	199 520	194 228
United Kingdom	{ i)	45 195	42 549	59 966	47 179	75 794	—	(1) 14 771
	{ j)			() 58 423	—	—	—	(1) 92 374
Sweden	a)	174 607	158 954	146 608	138 230	136 066	121 255	113 318
Switzerland		64 375	67 241	59 525	62 832	63 934	56 218	50 486
Czechoslovakia	a)			30 424	25 133	25 574	25 794	—
U.R.S.S.	f)	435 855			343 922	304 239	274 256	157 852
Canada	{ h)	266 981	246 478	250 887	240 966	234 793	218 479	214 070
	{ i)		113 098	113 979	114 200	110 011	106 484	106 925
	{ Total		359 576	364 866	355 166	344 804	324 963	320 995
United States	{ a) i)	1 757 311	1 786 191	1 623 930	1 629 442	1 632 308	1 694 699	1 762 602
	{ k)		2 646	2 425	1 984	1 543	1 102	882
	{ Total			1 626 576	1 631 867	1 634 292	1 696 242	1 763 704
Guatemala				882	1 323	1 323	—	(1) 220
Argentina		75 178	65 918	70 328	61 509	64 596	71 871	81 351
Brazil		59 526	46 297	36 817	39 022	35 935	—	—
Chile				8 819	—	—	—	(1) 7 716
Uruguay			441	—	—	—	1 543	1 543
Japan				5 512	5 953	5 512	4 630	3 968
Syria and Lebanon			15 653	7 716	—	—	4 409	8 157
Algeria							(1) 4 630	—
Union of South Africa	{ a)	30 024	30 058	32 224	26 526	18 658	—	(1) 18 298
	{ b)	13 260	12 925	14 430	14 276	11 959	—	(1) 11 244
	{ Total	43 284	43 053	46 654	40 802	30 617	—	(1) 29 542
Australia	{ a)	436 076	409 620	372 362	410 723	446 879	428 139	397 936
	{ b)	22 487	20 503	22 046	22 928	22 708	21 826	20 503
	{ Total	458 563	430 123	394 408	433 651	469 807	450 847	390 660
New Zealand	{ a) i)	331 135	306 664	397 936	376 992	353 623	362 662	333 119
	{ b)	5 732	—	—	—	—	—	277 563

* See estimate in text

(a) In creameries — (b) In farms — (c) Cow buffalo ewe and goat milk — (d) State controlled
(e) Uncontrolled — (f) In cooperative dairies — (g) In private dairies and homes — (h) In all factories —
(h) Including whey butter — (k) Processed butter — (l) Incomplete figures(1) Estimate — (2) Including quantity produced in private dairy factories 1931 319 089 11 1938 431 587 11
Year ending June 4 — (3) 1931 — (4) 1930 — (5) 1929 30

production in Australia last year was second only to that of 1934-45, that of New Zealand was smaller than in any recent year, except 1937-38 and 1931-32.

Although few figures are available for the remaining countries, it appears probable from the available reports that production in 1939 was generally satisfactory to good. In Denmark, for example, production during the spring and summer was very large. In the period after the opening of hostilities a contraction certainly took place. The poor prices on the English market and the difficulty of obtaining fodder supplies in Denmark caused a reduction in the numbers of livestock.

In France, on the basis of the statistics of milk utilization, a fall in 1938 butter production of about 44 million lb., or 10 per cent., compared with 1937, is indicated. This decline is principally to be attributed to the ravages of foot-and-mouth disease.

In Great Britain, where farm production is of secondary importance, figures are available only up to 1938. Butter was rationed only at the beginning of 1940, the ration being first 16 oz. and subsequently 32 oz. per four weeks.

Trade.

In order to make a comparison of the incomplete data available for certain countries in 1939 with those of the previous year, a column has been left in the tables of international trade for figures of the corresponding period of 1938. Where complete data are available for 1939, a dash is left in this column.

In the case of exports the number of countries with incomplete data is large but for the most important exporting countries the statistics are complete. The countries for which the 1939 data are available, in fact, contributed about three-quarters of total exports. For the remaining countries in the table the figures generally cover only the period to the end of July or to the end of August.

The available data thus provide a reasonable basis for comparison. The figures reveal certain notable changes. On the aggregate, there is a contraction in international trade of roughly 6,600,000 lb. compared with the corresponding period of last year. The difference would be still larger if the countries of Oceania had not increased their exports towards the end of the year. The number of countries showing an increase is approximately the same as the number showing a decrease.

In Denmark exports during 1938 were the largest since 1933; they were slightly heavier than those of 1932 but considerably below the maxima of 1931 and 1930. While there was a decline in 1939, exports exceeded slightly the average of 1933-37.

In New Zealand, on the other hand, exports in 1939 were the smallest since 1933, a period which includes, however, some of New Zealand's best export years. The reduction, which in actual figures does not greatly exceed that of Denmark, is relatively very heavy. It may be recalled that New Zealand exports, following their increase and the simultaneous decrease in Danish exports, had by 1937 practically reached the level of the latter, whereas ten years before they represented only a half. But by the end of 1939 New Zealand's

Exports of Butter from the Principal Exporting Countries

(1000 lb.)

COUNTRIES	1939	1938 ^A	1938 ^B	1937	1936	1935	1934	1933
Denmark	330,267	—	348,459	337,304	322,328	305,024	330,311	332,269
New Zealand	274,263	—	293,233	333,325	313,174	312,445	292,823	295,143
Australia	249,621	—	229,407	182,916	185,672	256,769	246,782	211,532
Netherlands	124,416	—	112,140	118,647	132,686	103,148	81,320	62,552
Sweden	(4) 47 589	(4) 52,889	62,953	51,886	42 126	44,670	51,152	37,759
Latvia	(3) 35,633	(3) 34,851	51,714	42,353	38 118	37,073	34,615	34,494
Ireland	(3) 21,378	(3) 29,132	42,278	42,552	58 032	59,470	56,886	45,232
Lithuania	(3) 27,419	(3) 24,811	38,387	33,197	32,252	26,795	21,321	21,120
Finland	(3) 27 593	(3) 27 595	37,763	30,733	30,836	22,582	24,467	26,202
Estonia	(3) 23 129	(3) 21,888	32,479	29,057	24 152	23,894	22,306	20,336
Poland	(2) 18 958	(2) 21 625	29,086	17,877	24,046	12 533	9,782	3,547
Argentina	19 745	—	16,173	19,361	22,639	14,950	18,347	30,664
Hungary	3 307	—	7,760	13,122	10,401	5,518	8,790	8 038
France	(2) 3 466	(-) 3 607	6,449	6,629	12,677	11,603	7,297	6 829
India, by sea	5 785	—	6,116	4,908	3,111	3,023	3,027	2,943
Canada	(-) 10 538	(2) 991	3,821	4,096	5 130	7,696	428	4,437
Union of South Africa	6 929	—	3,535	7,205	9,308	8,874	2,485	2,482
Austria	(1) 0	(1) 2 606	2,606	7,637	5 688	7,053	2,606	2,606
U S S R	—	—	743	32,236	51,097	64,148	83,562	82,023
WORLD TOTAL (5)			1,368,052	1,357,069	1,363,211	1,368,332	1,336,160	1,263,597

^A Part of the year corresponding to that indicated for 1939. — ^B Full year.

(1) Up to March 31 — (2) Up to July 31 — (3) Up to August 31 — (4) Up to September 30 — (5) From the International Yearbook of Agricultural Statistics

attempt to take Denmark's place as leading exporting country had suffered a setback.

Australia shows an increase approximately off-setting the decrease in New Zealand. Her exports thus have nearly attained the record figure of 1935 and approach very close to the exports of New Zealand. As the Netherlands also show a very considerable increase of more than 10 per cent. on the previous year's figure, the total of the four largest exporting countries in 1939 is only slightly smaller than that of 1938, despite the fall in Danish and New Zealand exports, and exceeds by 3 per cent. the average of 1933 to 1937.

Of the partial statistics of the remaining countries the principal features are the increase in Canadian and Argentine exports and the decrease in the figures for Ireland, Sweden and Hungary.

Though the total volume of butter exports has contracted slightly, compared with last year, so far as can be judged from the information available, it appears to have been normal compared with previous years. In countries which have not published returns for the last months of the year a further reduction may have occurred, but this is unlikely.

Data on butter imports in 1939 are much more incomplete than those of exports. There are fewer statistics covering the whole year. In the case of Great Britain, which alone absorbs about four-fifths of the world trade, the statistics do not go beyond August 31; those of Germany, which takes most of the remainder, do not go beyond July 31. During the period in question

Imports of Butter into the Principal Importing Countries.

(000 lb.)

COUNTRIES	1939	1938 A	1938 B	1937	1936	1935	1934	1933
United Kingdom (1) . . .	(4) 725,528	(4) 741,741	1,056,102	1,041,988	1,082,963	1,082,963	1,074,768	979,550
Germany	(3) 110,445	(3) 114,592	204,113	191,439	166,245	156,529	136,165	130,391
Netherlands Indies	(7) 8,935	(7) 9,601	9,903	10,514	12,745	14,037	14,114	13,752
India	(8) 5,399	(8) 5,937	6,874	6,598	1,532	1,345	1,166	908
Canada	(3) 4	(1) 5,227	5,232	66	119	148	2,873	1,378
Palestine	4,389	—	4,493	5,340	5,494	5,053	3,909	1,927
British Malaya	(5) 4,317	(5) 3,924	4,691	4,431	4,103	3,759	3,404	3,106
Algeria	(2) 1,922	(2) 2,105	4,332	4,114	4,394	4,766	4,791	4,105
Belg.-Luxemburg E. U. . . .	(6) 2,081	(6) 1,819	2,540	4,969	8,142	13,305	20,693	27,408
Czecho-Slovakia	(3) 2,335	(3) 0	2,264	1,676	496	2,928	2,227	1,495
United States	1,107	—	1,618	11,111	9,872	22,675	1,252	553
France	(3) 1,153	(3) 789	1,340	1,495	4,251	1,510	9,603	20,307
Italy	(3) 470	(3) 234	463	5,115	939	930	3,311	2,361
Switzerland	3,161	—	340	5,624	3,223	302	653	1,146
WORLD TOTAL (9) . . . .	...	...	1,366,593	1,359,022	1,364,836	1,357,382	1,343,601	1,250,654

A Part of the year corresponding to that indicated for 1939 — B Full year

(1) Re-exports have been deducted — (2) Up to June 30 — (3) Up to July 31 — (4) Up to August 31 — (5) Up to October 31 — (6) Up to November 30 — (7) Full year for Java and Madura, up to November 30 or outlying provinces — (8) Full year for sea-borne imports, up to September 30 for overland exports — (9) From the International Yearbook of Agricultural Statistics

imports in both countries were slightly below those of the previous year. In the other countries the changes were not particularly striking. The largest difference is the contraction in British imports of 16,204,000 lb. This is not a large figure and the partial figures of imports confirm the impression that there were no important changes in the months preceding the war. During the remainder of the year also there do not appear to have been great changes.

To remedy to some extent the absence of complete figures for 1939 for the principal importing countries, we reproduce the exports of Denmark and the Netherlands by countries of destination. This is not necessary in the case of the other two important butter exporters because they ship their butter almost exclusively to the United Kingdom. Danish exports to Germany have increased continuously during the years considered. The increase was slight

*Exports of Butter *) from Denmark by countries of destination.*

(000 lb.)

Countries	1939	1938	1937	1936	1935	1934	1933	1932
United Kingdom	226,654	263,178	255,356	241,905	241,149	274,022	278,727	284,349
Germany	96,402	80,295	76,318	75,568	55,120	44,232	35,636	29,163
Other countries	4,274	3,739	4,261	3,695	7,794	11,235	17,033	33,644
Total	327,330	347,212	335,935	321,168	304,063	329,489	331,396	347,156

*) Excluding butter in sealed tins.

after 1936 but in 1939 there was a more marked rise. On the other hand, shipments to the United Kingdom in 1939 were much smaller than they were during the seven preceding years. During the war months exports to Germany were 9,599,000 lb. larger while those to Great Britain were down by 10,831,000 lb.

Exports of Butter from Netherlands by countries of destination.

(000 lb.).

Countries	1939 (1)	1938 (1)	1937 (1)	1936 (2)	1935 (2)	1934 (2)	1933 (2)	1932 (2)
United Kingdom	93,408	78,575	79,398	90,370	56,688	38,133	17,985	5,148
Germany	23,312	27,326	28,329	25,693	26,061	32,009	28,323	21,793
Other countries	7,696	6,239	10,920	18,623	20,399	11,178	16,244	17,983
<i>Total</i>	<i>124,416</i>	<i>112,140</i>	<i>118,647</i>	<i>132,686</i>	<i>103,148</i>	<i>81,320</i>	<i>62,552</i>	<i>44,924</i>

(1) Net — (2) Gross

The exports from the Netherlands to Great Britain, however, showed an increase and those to Germany a decrease, but in both cases the differences were much smaller than those observed in Danish exports.

We reproduce the figure of British and German imports though they relate to only part of the year 1939. Changes in British imports during the period January-August were similar to the changes which were shown in the exports of the supplying countries for the whole year. Thus it would appear that there was a reduction during the war months compared with the year before, but no essential change from the situation during the first part of the year 1939.

Imports of Butter into the United Kingdom by countries of origin.

(000 lb.).

COUNTRIES OF ORIGIN	1939 (1)	1938 (1)	1937 (1)	1936 (2)	1935 (2)	1934 (2)	1933 (2)
New Zealand	185,330	208,307	289,245	330,494	312,684	295,400	299,801
Denmark	159,906	185,090	264,913	252,935	243,219	244,871	278,411
Australia	150,530	132,359	201,362	167,018	189,749	236,702	235,577
Netherlands	75,134	59,117	79,757	80,257	83,475	51,947	33,727
Latvia	24,176	23,770	38,070	24,291	21,996	21,541	17,445
Ireland	22,126	17,705	36,579	35,838	52,446	54,708	52,459
U. S. S. R.	—	—	—	30,617	46,150	56,358	55,045
Other countries	115,018	120,988	155,023	133,324	141,240	114,566	113,414
<i>TOTAL</i>	<i>732,220</i>	<i>747,336</i>	<i>1,064,949</i>	<i>1,054,774</i>	<i>1,090,959</i>	<i>1,076,093</i>	<i>1,085,879</i>
Re exports	6,689	5,595	8,847	12,787	7,996	14,271	11,114
United Kingdom exports	1,001	844	1,354	1,409	1,232	1,398	1,477
<i>NET IMPORTS</i>	<i>724,530</i>	<i>740,897</i>	<i>1,054,748</i>	<i>1,040,578</i>	<i>1,081,731</i>	<i>1,060,424</i>	<i>1,073,288</i>

(1) January 1 to August 31. — (2) Full year

Import of Butter into Germany by countries of origin.

(000 lb)

COUNTRIES OF ORIGIN	1939 (¹)	1938 (¹)	1938 (²)	1937 (²)	1936 (¹)	1935 (¹)	1934 (¹)	1933 (¹)
Denmark	45,874	47,891	80,537	75,559	73,502	56,291	42,933	36,678
Sweden	16,286	11,041	27,097	27,463	22,926	21,246	12,584	10,836
Netherlands	12,176	17,260	27,620	26,792	21,581	23,647	28,579	25,441
Other countries . . .	36,110	37,754	68,211	61,625	48,236	55,345	52,069	57,436
TOTAL	110,446	113,946	203,465	191,439	166,245	156,529	136,165	130,391

(¹) January 1 to July 31 — (²) Full year.

There was a reduction in German imports in the first part of the year. This confirms that the increase in Danish exports occurred after the outbreak of the war. The reduction in imports from the Netherlands, as shown by the German statistics, was equal to the reduction for the whole year as shown by Dutch statistics. Thus during the second half of the year German imports must have been at the normal level, notwithstanding the increase in home production.

Prices in 1939.

Butter markets in 1939 were very irregular. If the many fluctuations are ignored, three periods are discernible: (1) a steady period during the first two or three months, (2) the spring and summer when supply was plentiful and price differences particularly marked as compared with the first period, (3) the war months when the economic consequences of the war had strange and unexpected effects.

In studying the table of monthly average prices, it must be remembered that the periods which should logically be put together are often separated by the rigid but inevitable classification by calendar months. A proper classification would bring out more clearly the different phases. The table shows, in addition to the course of prices during the year in review, the figures for the preceding year in order to illustrate the different course of quotations. The year 1938 certainly cannot be taken as an ideal average year, but it is sufficiently normal to provide a more suitable comparison than the average of several years. Moreover, it must be remembered that the value of conversion into gold francs is more questionable in present circumstances, certain changes in the figures given resulting from exchange fluctuations and not from phenomena connected with the butter market.

European butter prices in 1939 showed the usual behaviour following an increasing supply during the warm season and a reduction at the end of the year. Unlike 1938 and most of the earlier years, the highest quotations were at the beginning of the year, particularly in February. Previously the highest

prices occurred at the end of the year, for since 1934 there has been a general tendency to an increase, as the annual averages show. Every winter prices were usually higher than in the previous year. This however, was not the case in 1939.

Prices of Butter in Gold Francs per Quintal, monthly averages

DESCRIPTION		Jan.	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Kobenhavn Danish . .	1938	160	154	144	149	155	148	148	154	162	150	159	166
	1939	162	170	159	144	139	138	145	143	142	142	145	159
London: Danish . . .	1938	199	192	184	185	194	185	185	197	197	187	196	203
	1939	199	206	185	181	175	175	181	174	175	175	171	171
Leeuwarden. Dutch	1938	136	139	138	148	150	136	132	127	129	127	126	138
	1939	140	141	130	122	114	123	124	117	119	130	130	130
London: Dutch	1938	169	172	173	179	184	169	166	160	162	156	152	171
	1939	175	176	161	153	143	155	154	147	—	175	171	171
London Australian, salted	1938	164	168	175	182	189	178	178	173	167	159	146	150
	1939	168	167	162	159	151	160	161	153	161	175	171	171
London New Zealand, salted	1938	166	164	176	183	193	182	180	178	174	164	153	157
	1939	172	171	164	161	154	165	174	166	165	175	171	171

Though prices during the first two or three months were higher than those of the preceding year, for the rest of the year they were in nearly all cases below those of the preceding year, mainly owing to the increase in supplies. At the end of the year the increase compared with the summer showed the same difference as in 1938. There was thus a seasonal increase but no substantial improvement compared with the low level of prices in summer, despite the war. Prices at London rose but the reason was the decline of sterling. There was a considerable drop in the prices of Danish butter, quotations in November and December touching the lowest level of the whole year, whereas in three of the preceding five years prices in this month had reached their highest point.

By the fixing of a single price for butter of all provenances and qualities in the United Kingdom (see Crop Report for November 1939, page 1065), the premium on Danish butter, to the slow reduction of which attention was drawn in our article of last year, was suddenly removed completely on the London market. Prices at Copenhagen were improved slightly by subsidies.

The fixing of a general price in the United Kingdom had the contrary effect on the butter of Australia and New Zealand. In this case there was an appreciable improvement in prices which reached their highest level for the year at a time when they are generally at their lowest points.

In Germany the prices fixed on October 15, 1938 remained in force for the whole of 1939 (see Crop Report for February 1940, page 144).

The annual averages bring out the low prices which were current during the greater part of 1939. For nearly all quotations the rising trend of the years 1934 to 1938 was replaced by a decline which brought prices down below the 1937 average. The reason for the generally low level of prices must be looked for in the volume of production. Demand however, also contracted owing to

the size of the stocks which had been built up in several countries. Prices expressed in gold francs did not increase after the outbreak of the war, although transport became more difficult and costly. Part of the loss due to the exchange

Prices of Butter in Gold Francs per Quintal, yearly averages.

DESCRIPTION	1930	1938	1939	1940	1941	1942	1943	1944
Kobenhavn: Danish	148.96	153.83	151.84	140.86	129.70	111.34	131.90	173.71
Leeuwarden: Dutch	126.57	135.22	130.90	112.47	101.80	92.48	125.37	196.37
Germany: Butter with quality mark . .	336.86	324.70	321.10	321.33	(1)321.38	(1)314.83	(1)277.77	(1)285.57
London:								
Danish	180.75	191.35	189.35	178.59	167.62	150.88	174.82	219.91
Australian, salted	163.26	169.20	163.38	149.77	133.27	107.41	134.63	188.97
New Zealand, salted	167.38	172.59	164.51	150.92	135.38	111.11	136.44	196.45

(1) Hamburg: Schleswig-Holstein.

differences was borne by the butter producers and by the public in the surplus producing countries, while the consumers in the importing countries did not on the whole feel the consequences.

The new development of the war is expected to have appreciable effects on the butter market in 1940.

WALTHER SCHUBRING

CURRENT INFORMATION ON LIVESTOCK AND DERIVATIVES.

Greece: The abnormal weather conditions of the first half of March, had an unfavourable effect on stock breeding, particularly owing to the difficulty of obtaining fodder supplies. A reduction in milk production is consequently forecast. Cheese making is proceeding actively. With few exceptions stock are in good condition.

Ireland: The milk yield in March was better than in February but slightly below normal for the season.

Switzerland: According to an enquiry conducted among 765 dairies, milk deliveries show a decrease of 5.5 per cent. on last year. In German Switzerland the decrease is 5.1 per cent and in French Switzerland 5.9 per cent.

Argentina: The condition of stock in March was good in the country as a whole. The second clip was in progress in the southeast of Buenos Aires province, with generally good yields.

Union of South Africa: Good rains fell in February in most parts of Cape Province, except in Transkei and the northeast where drought is severe. Grazing improved to some extent and stock generally were in fair condition.

Only light scattered rains fell in February in most parts of Natal, Transvaal and the Orange Free State. Grazing, however, though dry, was still sufficient in most parts and stock generally were in reasonably good condition. In parts of the Orange Free State, however, particularly the northwest, drought was severe and some migration of stock was necessary.

CURRENT INFORMATION ON SERICULTURE.

See the table of supplementary figures on pages 288-9.

WHEAT, RYE

TRADE

The following countries, having suspended publication of trade statistics, do not appear in the tables Germany, Bohemia Moravia (Protectorate), Bulgaria, Spain, Estonia, Finland, France, Ireland, Italy, Latvia, U. S. S. R., Iraq, Syria and Lebanon, Algeria, Madagascar, French Morocco, Tunisia.

COUNTRIES	JANUARY				SEVEN MONTHS (August 1 end of February)				TWELVE MONTHS (August 1 July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939 40	1938 39	1939 40	1938 39	1938 39	193 39
Wheat. — thousand centals (1 cental 100 lb)										
<i>Importing countries</i>										
Austria	496	1 699	0	0	15 173	10 331	0	0	16 316	0
Belgium	1 252	1 577	0	0	12 927	16 541	0	0	27 571	0
Canada					() 3 909	() 2 421	()	0	3 233	0
France	3 959	3 448			68 860	56 864			87 746	935
United States	496	5 269	858	611	8 171	26 840	3 869	3 257	46 004	6 134
Argentina	6 239	4 456	—	—	60 298	22 332	—	—	69 975	—
China					(1) 1 221	(1) 1 795	(1) 0	(1) 276	0	483
Denmark	0	413	0	0	(1) 108	(1) 1 934	(1) 355	(1) 2 347	2 413	8
Finland					(4) 142	(4) 138	(4) 28	(4) 45	1 984	4 421
Germany					(1) 0	(1) 0	(1) 0	(1) 0	443	132
Holland					(4) 0	(4) 0	(4) 3	(4) 3	0	0
Manchukuo									0	16
Turkey	61	91	—	—	119	1 025	—	—	1 098	—
Japan	1	0	0	0	2	1	28	0	—	60
Switzerland	3 354	4 601	0	0	10 940	19 968	0	0	36 429	0
<i>Exporting countries</i>										
Belgium Luxembourg	0	54	2 061	1 589	62	1 794	15 444	13 484	2 219	24 891
Denmark	5	1	267	108	34	39	1 618	1 682	40	2 364
France	0	0	334	284	0	0	3 697	3 360	0	7 740
Norway					(1) 0	(1) 0	(1) 0	(1) 0	0	4 002
Netherlands	0	5	680	846	2	70	7 509	8 815	21	15 623
Portugal					(1) 0	(1) 0	(1) 245	(1) 1 192	0	1 295
Mexico					(3) 0	(3) 0	(3) 13	(3) 113	0	1 243
Latvia	—	—	—	—	(2) 0	(2) 0	(2) 6 273	(2) 7 529	—	23 172
Lithuania	—	—	—	—	(2) 0	(2) 0	(2) 1 182	(2) 1 141	0	2 625
Barma	0	0	9	2	5	3	45	51	7	68
Belgium	—	—	23	10	—	—	72	43	—	91
China	4	1	165	552	170	147	866	522	511	9 597
Denmark	—	—	—	—	() 0	() 0	() 11	() 22	0	86
Finland	—	—	—	—	() 0	() 0	() 3	() 3	—	14
Germany	—	—	—	—	(1) 0	(1) 0	(1) 1	(1) 2	—	0
France	—	—	—	—	() 0	() 0	() 274	() 233	—	679
British Malaya	—	—	—	—	() 2	() 1	() 13	() 6	4	16
Palestine	0	0	22	293	0	0	406	871	0	1 791
Union of South Africa					(3) 0	(3) 0	(3) 103	(3) 1 022	0	1 030
New Zealand					() 0	(2) 0	(2) 250	(2) 400	0	2 006
Rye. — thousand centals (1 cental 1 lb)										
<i>Importing countries</i>										
Belgium	126	15	0	0	(1) 271	(1) 175	(1) 0	(1) 0	309	0
Belgium					(1) 913	(1) 60	(1) 0	(1) 0	640	0
Belgium					() 0	() 0	() 0	() 0	0	0
Canada					(1) 1 657	(1) 469			984	0
United States	44	0	0	0	142	374	0	0	574	0
Argentina	509	44	—	—	3 482	237	—	—	2 064	—
Turkey	3	10	—	—	30	21	—	—	177	—
<i>Exporting countries</i>										
Belgium Luxembourg	0	0	370	360	0	21	1 905	4 011	32	6 863
Denmark	0	0	31	130	0	1	1 134	1 308	1	2 061
France	0	0	0	0	0	0	0	0	0	0
Norway					(1) 0	(1) 0	(1) 1 747	(1) 1 612	0	2 734
Netherlands	0	91	7	52	1	940	498	498	976	1 649
Palestine	—	—	11	20	—	—	168	91	—	188

(1) Up to January 31 — (2) Up to December — (3) Up to November 30 — (4) Up to October 31

COUNTRIES	FEBRUARY				SEVEN MONTHS (August 1-end of February)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39

Wheat Flour. — Thousand centals (1 cental = 100 lb.).*Exporting Countries:*

Hungary	51	50	0	0	1,241	497	0	0	1,027	0
Romania	0	0	0	0	1	2	0	0	2	0
Yugoslavia	...	...	...	...	(2) 17	(2) 20	(2) 0	(2) 0	32	0
Canada	1,096	570	...	...	7,840	5,190	...	...	9,024	145
United States	995	1,320	0	24	7,566	6,838	95	105	14,059	159
Argentina	172	161	—	—	1,225	1,121	—	—	2,049	—
Uruguay	16	35	0	0	237	205	0	0	408	0
Chosen	...	...	...	...	(2) 132	(2) 292	(2) 0	(2) 0	523	0
India: by sea	...	...	...	...	(1) 699	(1) 724	(1) 2	(1) 1	1,172	4
Iran	...	...	...	...	(1) 0	(1) 0	(1) 0	(1) 0	0	0
Japan	...	...	...	...	(2) 2,721	(2) 2,749	(2) 60	(2) 0	4,594	0
Turkey	0	6	—	—	1	45	—	—	75	—
Australia	812	1,074	0	0	7,562	7,614	0	0	14,767	0

Importing Countries:

Belgo-Luxemb. E. U.	2	5	1	1	19	46	63	12	95	40
Denmark	0	2	3	37	19	17	101	319	33	540
Greece	0	0	1	3	0	0	23	21	0	43
Norway	...	...	...	...	(1) 1	(1) 4	(1) 608	(1) 494	6	820
Netherlands	0	0	54	149	4	3	1,153	894	5	1,829
Portugal	...	...	...	...	(1) 0	(1) 0	(1) 10	(1) 25	0	38
Haiti	—	—	18	17	—	—	113	103	—	177
Mexico	...	...	...	...	(3) 0	(3) 0	(3) 1	(3) 1	0	2
Brazil	...	...	...	...	—	—	(3) 261	(3) 372	—	798
Chile	...	...	...	...	(4) 0	(4) 0	(4) 20	(4) 14	2	93
Peru	...	...	...	...	(2) 0	(2) 0	(2) 19	(2) 18	0	42
Burma	0	0	44	48	1	0	454	405	1	865
Ceylon	—	—	27	21	—	—	297	218	—	366
China	60	34	204	291	732	264	3,502	2,796	1,176	7,108
Formosa	...	...	...	...	(3) 2	(3) 0	(3) 0	(3) 0	8	0
Netherlands Indies:	...	...	...	...	...	...	...	...	...	...
Java and Madura	—	—	...	...	—	—	(1) 745	(1) 660	—	1,271
Outer Provinces	—	—	...	...	—	—	(1) 503	(1) 383	—	746
Indochina	...	...	...	...	(1) 0	(1) 0	(1) 140	(1) 302	4	719
British Malaya	...	...	...	...	(2) 68	(2) 59	(2) 756	(2) 618	134	1,535
Manchukuo	...	...	...	...	(4) 0	(4) 0	(4) 3,127	(4) 1,730	0	5,592
Palestine	0	0	6	38	0	0	345	262	0	415
Egypt	0	0	4	4	1	0	31	25	0	46
Union of South Africa	...	...	...	...	(3) 2	(3) 1	(3) 4	(3) 3	2	9
New Zealand	...	...	...	...	(2) 0	(2) 0	(2) 0	(2) 0	0	1

Barley. — Thousand centals (1 cental = 100 lb.).*Exporting Countries:*

Denmark	0	334	17	0	299	2,010	29	9	3,002	21
Hungary	...	...	...	...	(1) 138	(1) 59	(1) 0	(1) 0	107	0
Romania	0	54	0	0	2,329	2,520	0	0	4,195	0
Yugoslavia	...	...	...	...	(2) 3	(2) 0	(2) 9	(2) 8	1	21
Canada	...	...	...	...	(1) 5,247	(1) 5,602	...	...	7,919	1
United States	134	345	0	0	1,463	4,323	141	0	5,101	237
Argentina	2,261	659	—	—	5,311	1,419	—	—	4,644	—
Chile	...	...	...	...	(4) 53	(4) 275	—	—	1,076	—
India: by sea	...	...	...	...	(1) 7	(1) 35	(1) 205	(1) 26	39	79
Iran	...	...	...	...	(1) 85	(1) 33	(1) 0	(1) 0	97	0
Manchukuo	...	...	...	...	(4) 0	(4) 1	—	—	5	—
Turkey	269	213	—	—	510	1,839	—	—	2,740	—
Egypt	0	6	0	2	1	68	0	13	68	19
Union of South Afr.	...	...	...	...	(3) 0	(3) 0	(3) 0	(3) 0	1	0
Australia	11	372	0	0	275	720	0	0	1,545	0

Importing Countries:

Belgo-Luxemb. E. U.	0	16	390	842	8	171	3,809	7,092	217	10,406
Greece	0	0	7	92	0	0	54	314	0	344
Norway	...	...	...	...	(1) 0	(1) 0	(1) 349	(1) 200	0	415
Netherlands	0	53	72	341	2	767	1,119	2,926	848	4,855
Mexico	...	...	...	...	(3) 0	(3) 0	(3) 32	(3) 50	0	146
Burma	...	...	0	1	—	—	3	3	—	4
Ceylon	...	...	1	1	—	—	6	7	—	11
Chosen	...	...	...	...	(2) 0	(2) 0	(2) 0	(2) 0	0	2
Indochina	...	...	...	...	(1) 0	(1) 0	(1) 0	(1) 0	0	1
Japan	...	...	...	...	—	—	(2) 0	(2) 0	—	0
Palestine	0	0	0	29	0	6	26	199	6	304
New Zealand	...	...	...	...	(2) 0	(2) 0	(2) 71	(2) 8	0	216

(1) Up to January 31. — (2) Up to December 31. — (3) Up to November 30. — (4) Up to October 31.

COUNTRIES	FEBRUARY				SEVEN MONTHS (August 1-end of February)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Oats. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Hungary . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 0	(1) 0	0	0
Romania	0	0	0	0	0	0	0	0	0	0
Yugoslavia . . . . .	...	...	...	...	(2) 0	(2) 0	(2) 0	(2) 0	0	0
Canada . . . . .	...	...	...	...	(1) 2,607	(1) 1,690	...	...	3,265	1,134
United States	17	23	202	3	36	1,096	1,340	29	1,114	427
Argentina	1,291	568	—	—	6,157	3,026	—	—	5,957	—
Chile . . . . .	...	...	...	...	(4) 185	(4) 121	(4) 0	(4) 0	1,119	0
Chosen . . . . .	...	...	...	...	(2) 0	(2) 0	(2) 0	(2) 0	1	0
India: by sea . . . . .	...	...	...	...	(1) 7	(1) 12	—	—	21	—
Turkey	0	7	—	—	6	134	—	—	231	—
Union of South Africa . . . . .	...	...	...	...	(2) 4	(2) 2	(2) 0	(2) 0	5	2
Australia	14	3	0	0	50	20	0	0	41	3
New Zealand . . . . .	...	...	...	...	(2) 0	(2) 0	(2) 4	(2) 2	4	5
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U.	0	0	13	54	0	1	64	248	1	655
Denmark	2	21	0	0	14	168	26	99	184	101
Greece	0	0	0	0	0	0	165	0	0	0
Norway . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 49	(1) 0	0	2
Netherlands	0	81	60	30	0	265	570	461	379	1,221
Mexico . . . . .	...	...	...	...	(3) 0	(3) 0	(3) 3	(3) 20	0	25
Peru . . . . .	...	...	...	...	—	—	(2) 10	(2) 11	—	26
Ceylon . . . . .	...	...	2	1	—	—	8	9	—	17
Indochina . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 0	(1) 0	0	0
Egypt . . . . .	...	...	0	0	—	—	0	0	—	1

Maize. — Thousand centals (1 cental = 100 lb.).

COUNTRIES	FEBRUARY				SEVEN MONTHS (August 1-end of February)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Maize. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Hungary	772	1,473	0	0	(1) 0	(1) 136	(1) 58	(1) 0	1,038	0
Romania . . . . .	...	...	...	...	3,473	5,052	0	0	12,014	0
Yugoslavia . . . . .	...	...	...	...	(2) 2	(2) 289	(2) 0	(2) 0	2,334	0
United States	3,220	1,501	32	7	9,787	10,967	116	73	19,783	253
Haiti	0	0	—	—	2	2	—	—	8	—
Dominican Republic . . . . .	...	...	...	...	(2) 47	(2) 69	—	—	340	—
Argentina	4,698	3,123	—	—	16,848	19,317	—	—	74,809	—
Brazil . . . . .	...	...	...	...	(3) 69	(3) 126	—	—	1,658	—
Burma	7	5	—	—	19	34	—	—	397	—
China	0	6	—	—	0	26	—	—	26	—
India: by sea . . . . .	...	...	...	...	(1) 0	(1) 1	—	—	1	—
Netherlands Indies:										
Java and Madura	157	415	—	—	238	563	—	—	1,353	—
Outer Provinces . . . . .	...	...	...	...	(1) 29	(1) 80	—	—	813	—
Indochina . . . . .	...	...	...	...	(1) 2,821	(1) 3,268	—	—	10,037	—
Manchukuo . . . . .	...	...	...	...	...	...	—	—	6,416	—
Egypt	0	0	0	0	1	1	0	0	2	1
Union of South Africa . . . . .	...	...	...	...	(2) 2,570	(2) 1,229	(3) 0	(3) 2	12,752	10
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U.	0	12	514	1,065	0	118	3,660	4,350	345	12,188
Denmark	0	0	704	524	0	0	1,407	884	1	2,855
Greece	0	0	18	109	0	0	151	466	0	1,336
Norway . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 779	(1) 788	0	2,647
Netherlands	0	0	1,218	1,342	0	0	5,470	5,943	2	15,958
Portugal . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 67	(1) 336	0	864
Mexico . . . . .	...	...	...	...	(3) 0	(3) 0	(3) 151	(3) 0	0	807
Peru . . . . .	...	...	...	...	(2) 0	(2) 0	(2) 0	(2) 0	0	0
Chosen . . . . .	...	...	...	...	(2) 1	(2) 4	(2) 50	(2) 0	118	488
Japan . . . . .	...	...	...	...	—	—	(2) 1,128	(2) 950	—	6,479
Palestine	0	0	10	12	0	0	37	45	0	160
Australia	0	0	0	0	0	0	11	0	0	0
New Zealand . . . . .	...	...	...	...	(2) 0	(2) 0	(2) 0	(2) 0	0	56

(1) Up to January 31. — (2) Up to December 31. — (3) Up to November 30. — (4) Up to October 31.

COUNTRIES	FEBRUARY				Two MONTHS (January 1-end of February)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1940	1939	1940	1939	1939	1939

Rice. — Thousand centals (1 cental = 100 lb.).

Exporting Countries:

United States . . .	318	302	25	42	569	614	45	89	3,093	711
Mexico . . .	...	...	...	...	...	...	...	...	(2) 49	(2) 0
Brazil . . .	...	...	...	...	...	...	...	...	(2) 1,231	—
Burma . . .	6,130	8,103	1	2	11,066	14,170	3	6	75,481	26
Chosen . . .	...	...	...	...	...	...	...	...	2,220	0
Taiwan . . .	...	...	...	...	...	...	...	...	(3) 287	(3) 0
Indochina . . .	...	...	...	...	(1) 5,479	(1) 1,778	(1) 3	(1) 24	35,273	197
Iran . . .	...	...	...	...	(1) 0	(1) 0	(1) 1	(1) 1	0	18
Thailand (Siam) . . .	3,029	3,248	—	—	6,210	6,173	—	—	41,010	—
Egypt . . .	436	254	0	0	913	633	0	0	2,579	2
Australia . . .	37	19	1	2	46	40	4	8	325	45

Importing Countries:

Belgo-Luxemb E. U. . .	0	33	186	103	0	71	496	202	365	1,780
Denmark . . .	0	0	18	4	0	0	73	21	1	197
Greece . . .	0	0	109	68	0	0	172	122	0	647
Hungary . . .	...	...	...	...	(1) 0	(1) 0	(1) 90	(1) 65	0	584
Norway . . .	...	...	...	...	(1) 1	(1) 1	(1) 40	(1) 7	6	160
Netherlands . . .	0	98	21	93	1	224	117	260	1,608	5,160
Portugal . . .	...	...	...	...	(1) 0	(1) 0	(1) 2	(1) 3	0	104
Romania . . .	...	...	39	26	—	—	102	62	—	360
Yugoslavia . . .	...	...	...	...	...	...	...	...	0	394
Haiti . . .	...	...	1	1	...	...	1	...	—	11
Argentina . . .	...	...	...	...	(1) 0	(1) 0	(1) 12	(1) 63	—	679
Chile . . .	...	...	...	...	...	...	...	...	—	(3) 183
Peru . . .	...	...	...	...	...	...	...	...	2	463
Ceylon . . .	0	0	1,032	1,227	1	0	2,591	2,305	3	13,391
China . . .	1	57	1,178	449	3	82	2,188	768	156	7,060
India: by sea . . .	...	...	...	...	(1) 386	(1) 407	(1) 3,187	(1) 2,668	6,343	51,294
: by land . . .	...	...	...	...	...	...	...	...	(3) 364	(3) 1,471
Netherlands Indies:										
Java and Madura . . .	32	6	...	...	32	11	(1) 60	(1) 0	258	729
Outer Provinces . . .	...	...	...	...	(1) 0	(1) 17	(1) 137	(1) 408	214	5,372
Japan . . .	...	...	...	...	...	...	...	...	444	965
British Malaya . . .	...	...	...	...	...	...	...	...	3,723	19,640
Manchukuo . . .	...	...	...	...	...	...	...	...	(3) 4	(3) 1,681
Palestine . . .	3	13	43	52	7	23	81	85	85	562
Union of Sout Afr. . .	...	...	...	...	...	...	...	...	0	1,748
New Zealand . . .	...	...	...	...	...	...	...	...	0	91

Linseed. — Thousand centals (1 cental = 100 lb.).

Exporting Countries:

Romania . . .	0	0	0	0	0	0	0	0	3	2
Argentina . . .	2,966	3,601	—	—	6,417	7,214	—	—	26,082	—
Uruguay . . .	109	138	—	—	442	345	—	—	2,403	—
China . . .	0	6	—	—	0	6	—	—	99	—
India: by sea . . .	...	...	...	...	(1) 206	(1) 510	(1) 0	(1) 0	5,934	—
: by land . . .	...	...	...	...	...	...	...	...	—	(3) 185
Manchukuo . . .	...	...	...	...	...	...	...	...	(3) 67	—
Egypt . . .	6	0	0	0	6	0	0	0	2	1
New Zealand . . .	...	...	...	...	...	...	...	...	2	0

Importing Countries:

Belgo-Luxemb E. U. . .	4	17	244	466	4	24	325	835	97	2,349
Denmark . . .	1	0	4	68	1	0	106	109	0	589
Greece . . .	0	0	7	2	0	0	7	7	0	71
Hungary . . .	...	...	...	...	(1) 0	(1) 0	(1) 2	(1) 0	0	34
Norway . . .	...	...	...	...	(1) 0	(1) 0	(1) 84	(1) 45	0	513
Netherlands . . .	70	31	153	1,062	87	55	493	1,591	142	6,833
Yugoslavia . . .	...	...	...	...	...	...	...	...	0	159
Canada . . .	...	...	...	...	...	...	...	...	10	335
United States . . .	—	—	987	1,259	—	—	1,580	2,441	—	8,976
Burma . . .	0	0	0	0	0	0	0	0	0	0
Japan . . .	...	...	...	...	...	...	...	...	0	52
Palestine . . .	...	...	1	6	...	...	1	6	—	24
Australia . . .	0	0	16	13	0	0	97	36	0	621

(1) Up to January 31. — (2) Up to November 30. — (3) Up to October 31. — (4) Up to July 31.

COUNTRIES	FEBRUARY				SEVEN MONTHS (August 1-end of February)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Cotton. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
United States	3,939	1,390	183	42	25,987	12,988	513	429	17,562	749
Haiti	12	18	—	—	12	20	—	—	104	—
Mexico	—	—	—	—	(3) 32	(3) 170	(3) 6	(3) 2	308	9
Dominican Republic	—	—	—	—	(2) 0	(2) 1	—	—	5	—
Argentina	27	18	—	—	297	347	—	—	555	—
Brazil	—	—	—	—	(3) 1,791	(3) 2,057	—	—	7,692	—
Peru	—	—	—	—	(2) 883	(2) 982	—	—	1,801	—
Burma	11	52	0	0	262	232	0	0	385	0
China	6	24	396	163	71	1,235	2,638	594	1,305	3,698
India: by sea	—	—	—	—	(1) 4,350	(1) 5,018	(1) 912	(1) 724	12,897	1,685
N. I.: Java & Mad.	0	1	—	—	2	8	—	—	17	—
Outer provinces	—	—	—	—	(1) 17	(1) 10	—	—	19	—
Iran	—	—	—	—	(1) 152	(1) 63	(1) 0	(1) 0	223	0
Turkey	36	0	—	—	67	264	—	—	385	—
Egypt	1,409	852	—	—	6,094	4,847	—	—	8,429	—
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U.	0	69	190	198	109	481	1,321	1,418	906	2,335
Denmark	—	—	20	70	—	—	110	108	—	202
Greece	0	0	5	4	0	0	31	22	0	49
Hungary	—	—	—	—	(1) 0	(1) 0	(1) 296	(1) 330	0	629
Norway	—	—	—	—	(1) 0	(1) 0	(1) 63	(1) 54	0	88
Netherlands	0	0	192	69	2	9	944	707	12	1,203
Portugal	—	—	—	—	—	—	(1) 239	(1) 300	—	474
Romania	0	0	48	22	0	0	171	284	0	433
Yugoslavia	—	—	—	—	(2) 0	(2) 0	(2) 147	(2) 246	0	515
Ceylon	0	0	2	1	0	0	17	9	—	1,269
Chosen	—	—	—	—	(2) 0	(2) 0	(2) 127	(2) 141	0	17
Indochina	—	—	—	—	(1) 3	(1) 3	(1) 95	(1) 378	5	601
Japan	—	—	—	—	(2) 0	(2) 1	(2) 5,749	(2) 5,573	1	13,176
Manchukuo	—	—	—	—	(4) 0	(4) 0	(4) 67	(4) 308	0	682
Palestine	0	0	2	2	1	0	12	8	0	16
Union of South Afr.	—	—	—	—	(3) 0	(3) 0	(3) 6	(3) 5	3	13
Australia	0	0	16	13	0	0	99	82	0	121
Wool. — Thousand lb.										
SIX MONTHS (September 1-end of February)										
<i>Exporting Countries:</i>									TWELVE MONTHS (Sept 1-Oct 31)	
Argentina { (a)	25,135	30,838	—	—	116,012	160,010	—	—	299,633	—
{ (b)	8,737	3,494	—	—	36,811	27,695	—	—	56,747	—
Chile	—	—	—	—	(4) 201	(4) 273	(1) 35	(4) 181	30,838	461
Peru	—	—	—	—	(2) 5,035	(2) 3,635	—	—	12,022	—
Uruguay { (a)	14,742	10,285	—	—	44,441	45,310	—	—	95,932	—
{ (b)	1,790	2,410	—	—	11,984	9,718	—	—	24,306	—
Burma	15	24	0	0	117	130	0	0	311	0
China	77	337	—	—	465	4,678	—	—	6,671	—
India: by sea	—	—	—	—	(1) 28,127	(1) 34,681	(1) 2,088	(1) 2,771	76,997	8,031
" by land	—	—	—	—	—	—	(4) 3,170	(4) 2,335	—	20,097
Iran	—	—	—	—	(1) 6,310	(1) 1,475	(1) 0	(1) 0	6,151	0
Manchukuo	—	—	—	—	(4) 104	(4) 498	(4) 93	(4) 0	3,567	295
Palestine	0	0	4	0	46	60	9	15	181	40
Turkey { (a)	130	873	—	—	4,766	10,441	—	—	21,272	—
{ (b)	187	276	128	49	1,773	2,542	209	207	5,176	465
Un. of S. Africa { (a)	—	—	—	—	(2) 48,120	(2) 102,207	(3) 13	(3) 425	234,846	1,058
{ (b)	—	—	—	—	(2) 2,853	(2) 1,916	(3) 143	(3) 368	7,994	1,587
Australia { (a)	104,001	91,904	33	1,034	434,583	515,328	1,133	6,984	799,315	15,655
{ (b)	6,488	4,947	0	9	23,574	33,634	66	161	66,604	604
New Zealand { (a)	—	—	—	—	(1) 43,277	(1) 69,572	(2) 0	(2) 46	254,591	55
{ (b)	—	—	—	—	(1) 3,746	(1) 13,444	(2) 0	(2) 4	57,270	4
<i>Importing Countries:</i>										
Belgo-Luxemb. { (a)	0	5,289	5,377	20,642	5,895	27,232	12,295	111,523	57,574	220,450
Econ. Un. { (b)	417	5,211	542	450	11,228	15,503	1,380	2,535	32,851	7,496
Denmark	2	44	148	419	172	174	1,281	1,490	408	4,533
Greece	68	49	234	357	304	719	1,455	2,760	2,103	7,657
Hungary	—	—	—	—	(1) 0	(1) 280	(1) 670	(1) 1,177	1,027	3,208
Norway	—	—	—	—	(1) 461	(1) 732	(1) 818	(1) 1,168	1,689	2,668
Netherlands { (a)	198	128	4,043	595	324	611	9,528	4,354	3,166	11,572
{ (b)	0	24	2,253	774	37	146	7,192	5,368	756	12,225
Portugal	—	—	—	—	(1) 2,035	(1) 395	(1) 608	(1) 1,691	2,251	840
Romania	0	0	4	137	—	18	77	578	62	840
Yugoslavia	—	—	—	—	(2) 0	(2) 220	(2) 1,082	(2) 4,394	353	11,475
United States	44	15	37,211	19,273	84	262	180,696	103,329	417	209,676
Mexico	—	—	—	—	(3) 0	(3) 0	(3) 1,345	(3) 1,008	199	4,837
Japan	—	—	—	—	(2) 0	(2) 26,469	(2) 29,716	—	0	107,351

(a) Unwashed wool. — (b) Washed wool. — (1) Up to January 31. — (2) Up to December 31. — (3) Up to November 30. — (4) Up to October 31.

COUNTRIES	FEBRUARY				TWO MONTHS (January 1-end of February)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1940	1939	1940	1939	1939	1939
Butter. — Thousand lb.										
<i>Exporting Countries:</i>										
Denmark	19,914	22,024	0	0	43,881	44,031	0	0	330,267	1
Hungary . . . . .	...	...	...	...	(1) 40	(1) 395	(1) 0	(1) 0	3,305	0
Norway . . . . .	...	...	...	...	(1) 0	(1) 42	(1) 0	(1) 0	126	0
Netherlands	6,706	5,604	0	0	16,971	12,842	0	0	124,420	0
Portugal . . . . .	...	...	...	...	(1) 9	(1) 9	(1) 0	(1) 0	157	0
Romania	139	29	0	0	203	51	0	0	955	0
Yugoslavia . . . . .	...	...	...	...	...	...	...	...	260	...
Argentina	2,584	2,053	...	...	7,796	3,922	...	...	19,745	...
Union of South Afr.	...	...	...	...	...	...	...	...	6,929	24
Australia	27,190	12,269	0	2	62,226	36,685	0	2	249,621	4
New Zealand . . . . .	...	...	...	...	(1) 27,247	(1) 32,662	(1) 0	(1) 0	274,258	2
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U.	0	2	0	450	0	2	...	1,773	26	2,081
Greece . . . . .	...	...	13	90	...	...	35	214	...	1,074
United States	187	150	106	66	417	273	172	165	2,308	1,107
Mexico . . . . .	...	...	...	...	...	...	...	...	...	(2) 123
Peru . . . . .	...	...	...	...	...	...	...	...	0	335
Burma . . . . .	...	...	62	55	...	...	119	134	...	719
Ceylon . . . . .	...	...	101	55	...	...	141	152	...	1,109
China . . . . .	...	...	40	33	...	...	93	77	...	593
India: by sea . . . . .	...	...	...	...	(1) 562	(1) 509	(1) 99	(1) 110	5,785	1,065
... by land . . . . .	...	...	...	...	...	...	...	...	...	(3) 4,531
Netherlands Indies:	...	...	...	...	...	...	...	...	...	...
Java and Madura . . . . .	...	...	...	...	...	...	(1) 626	(1) 397	...	6,698
Outer Provinces . . . . .	...	...	...	...	...	...	(1) 214	(1) 159	...	2,588
Indochina . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 117	(1) 705	...	2,037
Iran . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 7	(1) 20	...	4
British Malaya . . . . .	...	...	...	...	...	...	...	...	657	5,161
Palestine	0	0	611	392	0	0	791	888	2	4,389
Egypt	7	40	77	51	22	97	150	123	265	871
Cheese. — Thousand lb.										
<i>Exporting Countries:</i>										
Denmark	1,462	1,561	0	0	3,298	3,150	2	2	21,140	22
Hungary . . . . .	...	...	...	...	(1) 4	(1) 7	(1) 2	(1) 0	741	2
Norway . . . . .	...	...	...	...	(1) 280	(1) 260	(1) 37	(1) 44	3,466	648
Netherlands	9,123	8,567	37	51	18,565	17,743	90	90	114,531	615
Romania	24	15	4	2	31	18	13	11	392	57
Yugoslavia . . . . .	...	...	...	...	...	...	...	...	3,803	40
Argentina	386	340	...	...	703	664	...	...	5,474	84
Union of South Afr.	...	...	...	...	...	...	...	...	4,253	282
Australia	3,294	2,427	15	13	10,095	7,646	22	31	39,796	121
New Zealand . . . . .	...	...	...	...	(1) 19,548	(1) 20,893	(1) 0	(1) 0	187,166	2
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U.	18	15	3,265	3,521	33	35	6,942	8,181	236	52,007
Greece	2	4	15	351	18	4	22	536	95	2,198
Portugal . . . . .	...	...	...	...	(1) 18	(1) 24	(1) 2	(1) 11	216	201
United States	168	101	2,959	4,425	278	205	6,296	8,340	1,479	59,075
Mexico . . . . .	...	...	...	...	...	...	...	...	(2) 7	(2) 838
Chile . . . . .	...	...	...	...	...	...	...	...	(3) 7	(3) 75
Peru . . . . .	...	...	...	...	...	...	...	...	2	721
Burma . . . . .	...	...	11	7	...	...	15	22	...	97
Ceylon . . . . .	...	...	18	11	...	...	53	20	...	194
India: by sea . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 185	(1) 101	4	992
Netherlands Indies:	...	...	...	...	...	...	...	...	...	...
Java and Madura . . . . .	...	...	...	...	...	...	(1) 123	(1) 97	...	2,011
Outer Provinces . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 62	(1) 40	...	520
Indochina . . . . .	...	...	...	...	...	...	...	...	33	419
British Malaya . . . . .	...	...	...	...	...	...	...	...	...	...
Palestine	0	0	49	172	2	2	141	377	20	2,077
Egypt	0	2	536	472	7	20	955	776	64	5,315

(1) Up to January 31. — (2) Up to November 30. — (3) Up to October 31.

COUNTRIES	FEBRUARY				FIVE MONTHS (October 1-end of February)				TWELVE MONTHS (Oct. 1 Sept. 30)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Cacao. — Thousand lb.										
<i>Exporting Countries:</i>										
Haiti	79	368	—	—	(2) 1,682	2,811	—	—	3,979	—
Dominican Republic	...	...	—	—	(2) 5,858	(2) 7,659	—	—	63,690	—
Brazil	...	...	—	—	(3) 53,548	(1) 50,546	—	—	303,317	—
Guatemala	...	...	—	—	(1) 4,894	(1) 9,385	—	—	36,174	—
Trinidad	...	...	—	—	(2) 3,001	(2) 4,156	—	—	17,921	—
Ceylon	1,488	743	—	—	5,844	3,618	—	—	7,754	—
Java and Madura	112	359	—	—	1,003	1,689	—	—	3,098	—
Belgian Congo	...	...	—	—	(3) 412	(3) 289	—	—	2,806	—
Gold Coast	27,933	118,106	—	—	216,149	352,040	—	—	645,415	—
Nigeria & Cameroom	...	...	—	—	(2) 43,257	(2) 47,366	—	—	259,104	—
Sao Thomé and Príncipe Islands	...	...	—	—	(2) 5,833	(2) 8,830	—	—	23,202	—
<i>Importing Countries:</i>										
Belgo-Luxemb E. U.	0	0	1,257	1,713	0	0	13,891	10,743	168	26,678
Denmark	0	0	551	1,241	0	0	5,725	5,262	7	11,133
Greece	0	0	298	192	2	0	664	1,792	—	4,101
Hungary	—	—	...	...	—	0	(1) 1,116	(1) 3,942	—	13,045
Norway	...	...	...	...	(1) 0	(1) 0	(1) 4,381	(1) 2,341	0	8,185
Netherlands	0	24	25,962	19,478	0	1,100	56,463	70,956	1,537	180,200
Portugal	—	—	...	...	(1) 2	(1) 0	(1) 586	(1) 463	2	1,215
Romania	—	—	421	573	—	—	1,235	2,134	—	3,783
Yugoslavia	—	—	...	...	—	—	(2) 430	(2) 840	—	3,157
United States	—	—	69,254	75,264	—	—	283,321	198,637	—	583,184
Argentina	—	—	...	...	—	—	(1) 3,728	(1) 3,624	—	10,916
Uruguay	—	—	35	101	—	—	459	509	—	1,334
Palestine	—	—	84	84	—	—	406	348	—	1,451
Egypt	—	—	324	20	—	—	897	522	—	639
Union of South Africa	—	—	...	...	—	—	(3) 209	(3) 238	—	2,377
Australia	0	0	1,276	1,376	0	0	9,127	5,470	11	14,919
New Zealand	—	—	...	...	—	—	(2) 313	(2) 600	—	4,191
Coffee. — Thou-and lb.										
EXPORTS										
<i>Exporting Countries:</i>										
Costa Rica	...	...	—	—	(3) 5,124	(3) 4,458	—	—	45,429	—
Guatemala	...	...	—	—	(1) 37,474	(1) 41,284	—	—	93,844	—
Haiti	7,024	6,120	—	—	33,100	38,951	—	—	64,854	—
Jamaica	556	560	—	—	3,732	5,564	—	—	9,808	—
Mexico	...	...	—	—	(3) 13,369	(3) 11,559	—	—	79,766	—
Dominican Republic	...	...	—	—	(2) 8,353	(2) 7,670	—	—	30,459	—
Salvador	...	...	—	—	(1) 33,654	(1) 43,694	—	—	130,792	—
Brazil	175,603	153,742	—	—	1,462,177	1,421,777	—	—	2,155,720	—
Colombia	...	...	—	—	(1) 282,041	(1) 322,870	—	—	537,319	—
Netherlands Guyana	...	...	—	—	(2) 3,351	(2) 3,272	—	—	5,404	—
Peru	...	...	—	—	(2) 4,658	(2) 3,812	(2) 0	(2) 2	6,546	4
Venezuela	5,082	8,834	—	—	23,517	41,037	—	—	69,737	—
Aden by sea	...	...	—	—	(1) 7,220	(1) 6,365	—	—	11,380	—
India: by sea	...	...	—	—	(1) 5,966	(1) 6,166	(1) 0	(1) 0	23,153	7
N I Java & Mad.	5,172	5,210	—	—	42,534	38,358	—	—	55,202	—
Outer Provinces	...	...	—	—	(1) 50,969	(1) 73,363	—	—	106,993	—
Indochina	...	...	—	—	(1) 1,259	(1) 635	(1) 31	(1) 57	1,459	106
Belgian Congo	...	...	—	—	(1) 16,094	(1) 19,524	—	—	45,299	—
Kenia	...	...	—	—	(2) 13,274	(2) 14,220	—	—	38,142	—
Uganda	...	...	—	—	(2) 21,385	(2) 17,472	—	—	35,084	—
Tanganyika	...	...	—	—	(2) 27,005	(2) 19,659	—	—	30,622	—
<i>Importing Countries:</i>										
Belgo-Luxemb E. U.	9	42	8,750	9,110	267	3,750	77,356	74,968	4,017	118,025
Denmark	0	24	5,342	7,236	176	26	61,767	62,012	115	78,692
Greece	—	—	672	666	—	—	6,931	9,304	—	15,018
Hungary	—	—	...	...	—	—	(1) 2,180	(1) 2,610	—	5,390
Norway	...	...	...	...	(1) 7	(1) 75	(1) 27,734	(1) 22,829	104	44,174
Netherlands	9	1,080	7,273	6,784	4,032	10,346	61,630	79,360	16,339	113,585
Portugal	...	...	...	...	(1) 1,909	(1) 974	(1) 10,479	(1) 7,302	1,903	13,716
Romania	...	...	536	736	—	—	3,671	5,128	—	8,025
Yugoslavia	...	...	...	...	—	—	(2) 7,862	(2) 7,884	0	15,819
United States	1,056	908	162,071	142,670	8,587	6,113	1,346,385	1,304,793	10,598	1,965,955
Argentina	...	...	...	...	—	—	(1) 36,987	(1) 32,035	—	50,892
Chile	...	...	...	...	—	—	(4) 3,982	(4) 2,734	—	6,967
Uruguay	...	...	461	483	—	—	3,338	3,752	—	5,540
Burma	483	15	11	22	866	31	172	209	269	502
Ceylon	0	0	201	258	4	0	2,304	2,209	2	3,170
Japan	...	...	...	...	(2) 20	(2) 247	(2) 1,175	(2) 4,458	326	6,279
British Malaya	...	...	...	...	(2) 5,170	(2) 3,168	(2) 12,189	(2) 9,462	7,297	21,030
Palestine	0	0	814	322	4	0	2,709	1,845	0	3,624
Turkey	...	...	1,283	1,554	—	—	8,508	7,857	—	12,260
Egypt	...	...	1,312	977	—	—	10,699	7,683	—	12,081
Union of South Afr.	...	...	...	...	(2) 240	(2) 11	(2) 23,755	(2) 18,583	24	33,193
Australia	9	4	489	262	90	75	3,649	2,083	108	4,506
New Zealand	...	...	...	...	(2) 0	(2) 0	(2) 251	(2) 291	0	569

(1) Up to January 31. — (2) Up to December 31. — (3) Up to November 30. — (4) Up to October 31.

COUNTRIES	FEBRUARY				EIGHT MONTHS (July 1-end of February)				TWELVE MONTHS (July 1-June 30)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Tea. — Thousand lb.										
<i>Exporting Countries:</i>										
Ceylon	17,302	16,775	0	0	140,433	141,173	0	0	231,627	0
China	9,782	1,695	1,034	220	48,849	71,137	10,029	2,668	83,388	7,015
Taiwan	—	—	—	—	(3) 10,463	(3) 14,187	(3) 0	(3) 0	20,435	0
India: by sea	—	—	—	—	(1) 284,565	(1) 286,822	(1) 948	(1) 2,617	332,784	4,736
: by land	—	—	—	—	(4) 3,051	(4) 4,489	—	—	13,618	—
N. I. Java & Mad.	9,200	10,904	—	—	83,000	82,074	(1) 260	(1) 335	127,258	483
Outer Provinces	—	—	—	—	(1) 17,946	(1) 18,609	—	—	32,428	—
Indochina	—	—	—	—	(1) 4,281	(1) 3,051	(1) 331	(1) 710	4,738	944
Japan	—	—	—	—	(2) 34,491	(2) 23,129	(2) 73	(2) 86	35,023	130
<i>Importing Countries:</i>										
Belgo-Luxemb. E.U.	0	0	88	62	7	2	494	421	2	664
Denmark	0	0	141	84	2	2	1,371	1,032	2	1,561
Greece	—	—	22	24	—	—	214	320	—	414
Hungary	—	—	—	—	—	—	(1) 181	(1) 368	—	677
Norway	—	—	—	—	(1) 0	(1) 0	(1) 328	(1) 223	0	397
Netherlands	31	20	2,562	2,438	99	128	24,039	19,562	201	30,448
Portugal	—	—	—	—	—	—	(1) 192	(1) 201	—	317
Romania	—	—	33	84	—	—	545	549	—	800
Yugoslavia	—	—	—	—	—	—	(2) 172	(2) 289	—	485
United States	—	—	8,863	7,930	—	—	71,957	58,648	—	89,601
Argentina	—	—	—	—	—	—	(1) 3,161	(1) 3,027	—	4,802
Chile	—	—	—	—	—	—	(4) 2,044	(4) 2,116	—	6,792
Peru	—	—	—	—	—	—	(2) 503	(2) 595	—	1,074
Uruguay	—	—	62	20	—	—	320	342	—	450
Burma	42	0	245	448	580	128	1,645	1,208	163	2,255
Iran	—	—	—	—	(1) 0	(1) 0	(1) 8,940	(1) 10,091	0	17,785
British Malaya	—	—	—	—	(2) 666	(2) 664	(2) 2,624	(2) 2,661	1,495	5,060
Manchukuo	—	—	—	—	—	—	(4) 8,649	(4) 7,842	—	17,655
Palestine	2	0	71	44	11	0	503	338	0	677
Turkey	—	—	0	159	—	—	1,030	1,369	—	2,174
Egypt	—	—	1,618	1,360	—	—	10,772	11,107	—	16,535
Union of South Afr.	—	—	—	—	(3) 205	(3) 168	(2) 10,609	(2) 8,655	659	16,865
Australia	29	33	4,628	3,644	368	331	37,263	32,651	461	48,628
New Zealand	—	—	—	—	(2) 68	(2) 82	(2) 5,789	(2) 5,703	165	11,407
Total Wheat and Flour †. — Thousand centals (1 cental = 100 lb.).										
COUNTRIES	FEBRUARY				SEVEN MONTHS (August 31-end of February)				TWELVE MONTHS (August 1-July 31)	
	NET EXPORTS (*)	NET IMPORTS (**)	NET EXPORTS (*)	NET IMPORTS (**)	NET EXPORTS (*)	NET IMPORTS (**)	NET EXPORTS (*)	NET IMPORTS (**)	N. EX. (*)	N. IMP. (**)
Belgo-Luxemb. E.U.	—	—	2,059	1,530	—	—	15,239	11,644	—	22,599
Denmark	—	—	265	155	—	—	1,693	2,045	—	3,000
Greece	—	—	335	288	—	—	3,728	3,388	—	7,797
Hungary	564	1,765	—	—	16,827	10,963	—	—	17,685	—
Norway	—	—	—	—	—	—	(1) 4,854	(1) 2,581	—	5,087
Netherlands	—	—	751	1,041	—	—	9,041	9,984	—	18,034
Portugal	—	—	—	—	—	—	(1) 258	(1) 1,226	—	1,345
Romania	1,253	1,577	—	—	12,928	16,544	—	—	27,574	—
Yugoslavia	—	—	—	—	(2) 3,932	(2) 2,447	—	—	3,276	—
Canada	5,420	4,186	—	—	79,313	63,024	—	—	98,650	—
United States	965	6,386	—	—	14,264	32,560	—	—	58,402	—
Haiti	—	—	24	22	—	—	151	137	—	236
Mexico	—	—	—	—	—	—	(3) 14	(3) 114	—	1,246
Argentina	6,468	4,671	—	—	61,930	23,827	—	—	72,706	—
Brazil	—	—	—	—	—	—	(3) 6,621	(3) 8,025	—	24,236
Chile	—	—	—	—	—	—	(4) 26	(4) 294	—	604
Peru	—	—	—	—	—	—	(2) 1,207	(2) 1,166	—	2,681
Uruguay	22	460	—	—	1,536	2,061	—	—	2,948	—
Burma	—	—	67	66	—	—	644	588	—	1,212
Ceylon	—	—	58	38	—	—	468	334	—	579
China	—	—	352	892	—	—	4,388	3,781	—	16,996
Chosen	—	—	—	—	(2) 164	(2) 368	—	—	612	—
Taiwan	—	—	—	—	—	—	(3) 0	(3) 0	—	3
India: by sea	—	—	—	—	(1) 683	(1) 551	—	—	—	880
: by land	—	—	—	—	(4) 114	(4) 93	—	—	311	—
N. I. Java & Mad.	—	—	—	—	—	—	(1) 993	(1) 880	—	1,695
Outer Provinces	—	—	—	—	—	—	(1) 670	(1) 510	—	994
Indochina	—	—	—	—	—	—	(1) 188	(1) 405	—	960
Iran	—	—	—	—	—	—	(1) 0	(1) 0	—	0
Japan	—	—	—	—	(2) 3,275	(2) 3,432	—	—	5,445	—
British Malaya	—	—	—	—	—	—	(2) 929	(2) 751	—	1,881
Manchukuo	—	—	—	—	—	—	(4) 4,172	(4) 2,310	—	7,472
Palestine	—	—	30	343	—	—	866	1,221	—	2,345
Turkey	61	98	—	—	121	1,085	—	—	1,198	—
Egypt	—	—	4	6	—	—	67	33	—	119
Union of South Afr.	—	—	—	—	—	—	(3) 106	(3) 1,025	—	1,040
Australia	4,437	6,032	—	—	21,023	30,120	—	—	56,118	—
New Zealand	—	—	—	—	—	—	(2) 250	(2) 400	—	2,007

(*) Excess of exports over imports. — (**) Excess of imports over exports.

†) Flour reduced to grain on the basis of the coefficient: 1,000 centals of flour = 1,333.333 centals of grain.

(1) Up to January 31. — (2) Up to December 31. — (3) Up to November 30. — (4) Up to October 31.

STOCKS**Total wheat stocks in Canada on March 31.**

Stocks of home-grown wheat in all positions in Canada amounted, on March 31, 1940, to 223,185,000 centals, against 120,586,000 centals on the same date in 1939, 50,136,000 centals in 1938, 69,127,000 centals in 1937 and 148,078,000 centals in 1936

Stocks of cereals, linseed and potatoes in farmers' hands in Canada on March 31.

PRODUCTS	1940	1939	1938	1937	1936	1940	1939	1938	1937	1936
	Percentage of total production					Stocks in 1 000 centals				
Wheat	17	17	22	20	17	48 694	36 732	23 388	26 539	28 052
Rye	18	25	12	9	23	1 581	1 530	389	207	1 220
Barley	27	28	21	16	26	13 241	13 920	8 189	5 774	10 536
Oats	37	36	25	25	36	47 980	46 074	23 135	23 147	48 336
Linseed	15	14	11	12	14	184	109	48	123	135
Potatoes	41	27	33	27	30	9 037	9 588	13 878	10 482	11 447

Stocks of cereals in farmers' hands in the United States on April 1.

PRODUCTS	1940	1939	1938	1937	1936	1940	1939	1938	1937	1936
	Percentage of total production					Stocks in 1 000 centals				
Wheat	20.9	20.2	14.2	11.4	15.8	94 490	113 045	74 791	42 721	59 248
Oats	36.9	38.8	36.3	36.4	41.3	110 771	132 757	134 989	91 616	158 012
Maze (1)	54.5	52.9	45.6	32.6	40.5	719,883	683,538	599 827	229 081	456 992

(1) Data based on maize for grain

Imported cereals in Antwerpen.

PRODUCTS	Last day of month				
	March 1940	February 1940	January 1940	March 1939	March 1938
	thousand centals				
Wheat .	1,345	1,174	1,922	1 156	1 679
Rye .	102	128	29	57	22
Barley	208	160	214	84	252
Oats .	0	0	4	9	33
Maize	67	32	365	93	165

Commercial cereals in store in Canada and the United States.

PRODUCTS AND LOCATION	Friday or Saturday nearest 1st of month ⁽¹⁾				
	April 1940	March 1940	February 1940	April 1939	April 1938
	thousand cents				
WHEAT :					
Canadian in Canada	174,491	175,254	180,860	83,439	26,039
U.S. in Canada	487	487	487	65	596
U.S. in the United States	63,241	66,457	71,401	49,613	32,656
Canadian in the United States	13,415	16,665	20,551	1,064	666
TOTAL	251,634	258,863	273,299	134,181	59,957
RYE :					
Canadian in Canada	1,763	1,644	1,514	1,216	716
U.S. in Canada	13	13	13	13	330
U.S. in the United States	5,677	5,667	5,719	4,273	1,911
Canadian in the United States	629	506	506	24	0
TOTAL	8,082	7,830	7,752	5,526	2,957
BARLEY :					
Canadian in Canada	4,184	3,761	3,504	3,252	4,121
U.S. in Canada	1	1	2	0	0
U.S. in the United States	6,693	7,718	8,320	4,887	4,713
Canadian in the United States	610	741	1,003	0	55
TOTAL	11,488	12,221	12,829	8,139	8,889
OATS :					
Canadian in Canada	4,335	4,022	3,494	3,260	3,242
U.S. in Canada	38	46	54	45	357
U.S. in the United States	2,412	2,517	2,873	4,039	6,765
Canadian in the United States	137	250	313	0	70
TOTAL	6,922	6,835	6,734	7,344	10,364
MAIZE :					
U.S. in Canada	396	688	907	1,691	223
Argentine in Canada	0	0	0	16	91
South African in Canada	560	651	669	195	1,023
Australian in Canada	0	0	0	88	0
U.S. in the United States	22,234	22,722	23,692	24,495	24,207
TOTAL	23,190	24,061	25,268	26,485	25,544

(1) Friday for Canada, Saturday for the United States.

Commercial cereals ⁽¹⁾ and oilseeds in store in Argentina.

PRODUCTS AND LOCATION	First day of month				
	March 1940	February 1940	January 1940	March 1939	March 1938
	thousand cents				
Rye	5,212	3,852	1,045	1,582	287
Barley	7,101	6,742	1,934	4,097	2,611
Oats	5,069	5,833	3,522	5,469	4,625
Maize in the ports	2,581	5,802	8,233	525	61
Maize in other positions	1,376	2,641	4,628	1,938	678
TOTAL	3,957	8,443	12,861	2,463	739
Canaryseed	513	458	237	321	280
Linseed in the ports	4,651	2,709	1,464	5,682	4,991
Linseed in other positions	4,454	4,230	2,233	6,627	7,183
TOTAL	9,105	6,939	3,697	12,309	12,174
Sunflowerseed	40	64	292	178	—

⁽¹⁾ Figures for wheat in store have been withheld by governmental order.

Wheat and wheat-flour in the Union of South Africa.

LOCATION	Last day of month				
	February 1940	January 1940	December 1939	February 1939	February 1938
	thousand cents				
Wheat held by millers:					
South African		2,315	1,469	3,650	4,016
Imported		37	49	47	4
Wheat held by co-operatives		1,025	695	678	509
TOTAL		3,377	2,213	4,375	4,529
Wheat-flour and boermeal ⁽¹⁾ held by millers		262	236	261	199
Grand total ⁽¹⁾		3,740	2,540	4,727	4,796

(1) 140 lb of wheat flour or 165 lb of boermeal correspond to 200 lb of wheat. — (2) Including flour in terms of grain.

Cotton stocks on hand in the United States.

LOCATION	Last day of month				
	March 1940	February 1940	January 1940	March 1939	March 1938
	thousand cents				
In consuming establishments	7 846	8 363	8,736	6,853	8,781
In public storage and at compresses	56,103	59,809	64,975	66,278	54,373
TOTAL	63 948	68,172	73,711	73,131	63,154

Cotton stocks at Bombay, Alexandria and Port Sudan.

LOCATION	Thursday nearest 1st of month ⁽¹⁾				
	March 1940	February 1940	January 1940	March 1939	March 1938
	thousand cents				
Bombay ⁽²⁾	⁽¹⁾ 4,167	3,631	2,490	3,901	3,592
Alexandria ⁽²⁾	2,645	2,614	2,788	2,980	2,578
Port Sudan	438	246	236	247	413

⁽¹⁾ Stocks held by exporters, dealers and millers. — ⁽²⁾ Quantities consumed in Alexandria, or returned to the interior of the country, are not included. — ⁽³⁾ For Port Sudan the data refer to the last day of the preceding month — ⁽⁴⁾ Cotton stocks in Bombay on March 29: 4,745 thousand cents

AUTHORITIES: East Indian Cotton Assn. and Commission de la Bourse de Min-el-Bassal.

PRICES**PRICES BY PRODUCTS (*)**

All quotations are spot, on Fridays, unless otherwise stated. The monthly averages are based on the Friday quotations, and the yearly averages on the monthly.

DESCRIPTION	April	April	March	March	AVERAGE			Commercial Season (*)		
	12	5	29	21 or 22	March	April	April	1938-39	1937-38	
	1940	1940	1940	1940	1940	1939	1938			
Wheat										
Budapest: Tisza wheat, 78 kg. per hl (pengo per quintal)	20.75	20.75	20.75	20.75	* 20.75	20.91	21.40	20.42	21.44	
Braila: Home-grown, good qual. (lei p. ql.)	640	635	595	555	532	415	532	411	520	
Winnipeg: No. 1 Manitoba (cents p. 60 lb.)	89 1/8	88 1/8	87 1/8	88 1/8	86 7/8	60 1/8	138 7/8	62	131 1/8	
Chicago: No. 2 Hard Winter (cents p. 60 lb.)	110	108	106 1/2	n. 108	105 1/8	n. 73 1/8	n. 90 1/8	70 1/8	96 1/8	
Minneapolis (cents per 60 lb.):										
No. 1 Northern	105	104	101 1/8	103	101 1/8	75	97 1/8	74 1/8	104 1/8	
No. 2 Amber Durum	90 1/8	90 1/8	88 1/8	90 1/8	88 7/8	70 1/8	88 1/8	68 1/8	93 1/8	
New York: No. 2 Hard Winter (f.o.b. cents per 60 lb.)	130 1/8	128 1/8	127 1/8	128 1/8	125 1/8	84 1/8	107	84 1/8	112 1/8	
Buenos Aires (a): No. 2 Hard, 80 kg. per hl. (paper pesos per quintal)	8.60	8.15	7.55	7.70	7.52	7.00	11.41	6.89	12.20	
Karachi: White Karachi, 2% barley, 1 1/4% impurities (rupees per 556 lb.)	28-10-0	27-8-0	27-14-0	28-10-0	29-2-0	23-9-3	23-13-0	22-12-8	26-15-9	
Antwerpen (francs per quintal):										
Home-grown	158.00	158.00	158.00	158.00	158.40	130.25	133.80	123.75	135.05	
No. 1 Manitoba (Atlantic; c.i.f., arrived) (*)	159.75	160.00	161.00	163.75	165.35	90.85	174.50	96.25	171.20	
Bahia (c.i.f., arrived)	157.00	157.00	156.00	157.00	160.80	72.25	125.40	79.00	142.10	
London, Mark Lane: English (sh. per 504 lb.; at farm)	*) 31/6	*) 31/6	*) 31/6	*) 31/6	*) 31/6	* 20/10	34/10 1/8	20/7 1/8	37/7 1/8	
London, Baltic (f.o.b. parcels; sh. per 480 lb.):										
No. 1 Northern Manitoba (St. John)	n. q.	37/10 1/8	37/10 1/8	38/4 1/8	37/11 1/8	—	—	—	—	
No. 1 Northern Manitoba (Pacific)	32/7 1/8	32/1 1/8	32/1 1/8	32/4 1/8	31/10 1/8	—	—	—	—	
Barusso, 62 lb p. hl	*) 28/4 1/8	*) 27/-	*) 25/6	*) 25/6	*) 24/10	—	—	—	—	
A stralian	27/3	26/6	26/6	26/-	26/-	—	—	—	—	
Rye.										
Budapest: Pest rye (pengo p. quintal)	16.57	16.57	16.42	16.42	16.42	14.82	18.73	14.34	18.57	
Winnipeg: No. 2 rye (cents p. 56 lb.)	70 1/8	70 1/8	70 1/8	70 1/8	70 1/8	40	63 1/8	40 1/8	72 1/8	
Minneapolis: No. 2 rye (cents p. 56 lb.)	68 1/8	66 7/8	66 1/8	66 1/8	65 1/8	43 1/8	60 1/8	44	67 1/8	
Antwerpen (francs per quintal):										
Home-grown	141.00	141.00	143.00	142.00	143.60	n. q.	123.80	n. q.	124.85	
Danubian (c i f, arrived)	133.00	136.00	138.00	137.00	140.50	79.50	118.60	81.80	123.30	
Soviet (c.i.f., arrived)	135.00	138.00	139.00	139.00	151.90	61.25	104.00	61.15	112.50	
Plata (c.i.f., arrived)	134.00	138.00	138.00	136.00	140.70	77.60	118.60	80.80	124.55	
Barley.										
Braila: Average quality (lei p. quintal)	475	455	440	410	420	360	385	338	365	
Winnipeg: No. 4 West (cents p. 48 lb.) (*)	45	45	49	48 1/8	48	36 1/8	54 1/8	34 1/8	56 1/8	
Chicago: Feeding (on sample; cents p. 48 lb.)	45	45	45	45	45 1/8	40	52 1/8	40 1/8	51 1/8	
Minneapolis: No. 2 Feeding (cents p. 48 lb.)	48 1/8	48 1/2	47 1/8	47 1/8	47 1/8	42	50 1/8	40 1/8	53 1/8	
Antwerpen: (c.i.f., arrived; frs. per ql):										
Danubian	136.00	136.00	137.50	133.00	138.20	76.00	105.80	75.45	106.10	
No. 2 Federal (*)	n. q.	n. q.	n. q.	n. q.	n. q.	72.75	98.30	* 71.40	100.80	
Plata, 64/65 kg. per hl	133.00	134.00	136.00	133.00	139.00	75.10	106.00	74.20	106.80	
London, Mark Lane: English malting (sh. per 448 lb.; at farm)	70/-	70/-	70/-	70/-	70/3 1/8	* 35/-	47/6	* 36/1	* 53/-	
London, Baltic (f.o.b. St. John, parcels; sh. per 400 lb.):										
No. 3 Canadian 6-row	*) 24/1 1/8	*) 23 10/18	*) 24/3	*) 24/1 1/8	* 26 0/18	—	—	—	—	
La Plata new crop	15/9	16/-	*) 16/-	*) 16/-	15/11	—	—	—	—	
No. 1 Australian Chevalier (p. 448 lb.)	28.9	28/9	*) 28/3	*) 26/6	26/10 1/8	—	—	—	—	

* Indicates that the product was not quoted during part of the period under review. — n. q. = not quoted. — n. = nominal. — (†) Thursday prices.

(†) In relation to Government price fixing, numerous series are omitted from this table; notes concerning them have been given in various issues of the Crop Report: United Kingdom: Nov. 1939, p. 1060; Italy: Dec. 1939, p. 1163; Germany: Feb. 1940, p. 142; they will be continued. — (†) August-July. — (†) As from Jan. 19, 1940: No. 2 Manitoba. — (†) As from Sept. 22, 1939: No. 2 Feeding barley. — (†) As from Sept. 23, 1938: No. 3 Federal. — (†) Fixed maximum price; prices of seed wheat, which is not under control, are much higher. — (†) New crop. — (†) Shipping April. — (†) Shipping May, f.o.b. Montreal.

DESCRIPTION	April	April	March	March	AVERAGE			
	12	5	29	10	March	April	April	Commercial
	1940	1940	1940	1940	1940	1939	1938	Season 1)
Oats								
Winnipeg No 2 White (cents per 34 lb)		33 1/4	37 1/4	38	38 1/4	28 1/4	50 1/4	29
Chicago No 2 White (cents per 32 lb)	44 3/4	43 3/4	44 1/4	44 1/4	44 1/4	33 1/4	31 1/4	30 7/8
Buenos Aires (a) No 2 White, 49 kg per hl (paper pesos p quintal)	5 50	5 50	5 40	5 40	5 42	4 46	6 46	4 81
London, Mark Lane English white (sh per 336 lb, at farm)	36/-	36/-	36 -	36/-	36 7/16	18/10	25/6	19 3/16
London Baltic No 2 Canadian Western (f o b St John parcels, sh per 320 lb)	20 9	20 6	20 9	21/	22 8/16	—	—	—
Milano (b) (lire per quintal)								
Home grown	147 50	147 50	147 50	147 50	147 50	97 90	98 50	98 00
Foreign	n q	n q	n q	n q	n q	97 50	94 70	95 90
Maize.								
Braila Average quality (lei p quintal)	440	445	380	372	368	396	340	362
Chicago No 3 Yellow (cents p 56 lb)	62	59	57 1/2	58 1/4	57	49 1/4	57 1/4	51 1/4
Buenos Aires (a) Yellow Plata (paper pesos per quintal)	4 70	4 70	4 60	5 00	5 01 1/2	6 35	8 80	6 89
Antwerpen (c i f, arrived francs p ql)								
Bessarabian	n q	n q	n q	n q	n q	84 85	n q	87 90
Yellow Plata	138 00	140 00	143 50	144 00	147 70	85 10	115 20	90 20
Cinquantino (Argentine Cuarentino)	147 00	150 00	151 00	151 50	152 60	101 25	134 50	118 05
London, Baltic (f o b parcels, sh per 480 lb)								
No 2 Yellow American (Baltimore)	31 -	30/	29 10 1/2	30/-	29 10 1/4	—	—	—
Yellow Plata	14/10 1/2	14/6	14/9	15/1 1/2	15/2 1/4	—	—	—
Danubian kiln dried	n q	29/	29/-	29 1/2	n q	—	—	—
Rice (milled)								
Rangoon (delivered current month rupees per 7500 lb)								
No 2 Europe (Burma)	292-8	290-0	290-0	272-8	280-8	247 12	244 6	255-2
Kanungtoe small mills specials	262-0	260-0	262-8	252-8	257-10	227-12	217-0	231-9
Big mills specials	255-0	252-8	255-0	244 0	249 0	223-12	200-1	226-14
Saigon (Indochinese piastres p quintal)								
No 1 Round white 25 % broken						9 43	10 05	9 26
No 2 Japan 40 % broken						8 96	9 44	8 54
London (a) shipping current or following month sh p cwt)								
No 2 Burma (c i f U K) (2)	n q	n q	n q	n q	n q	7 11 1/2	7/9	7 8 1/4
Loonzun Kanungtoe (f o b Rangoon)	6 10 1/2	6/9	6/9	6/7 1/2	6/8 1/4	—	—	—
No 1 Saigon (f o b Saigon)	7 1 1/4	7/-	6/10 1/2	6/7 1/2	7/3	—	—	—
Siam Super (f o b Bangkok) (1)	7/10 1/4	8/3	8/1 1/4	7/9	8/0 1/4	—	—	—
Tokyo "Tyumai" brown Japanese average quality (yens per koku)					35 20	34 00	37 27	34 26
Linseed.								
Buenos Aires (a) Current quality 4 % impurities (paper pesos p quintal)	18 80	18 55	17 65	17 75	17 54	14 29	14 87	15 12
Bombay Bold (rupees per cwt)	10-0-6	9-8-0	9-3-0	9-0-6	9-2-1	6-11-10	7-5-2	7-12-7
Antwerpen Plata (c i f, arrived frs per quintal)	253 00	253 00	250 00	257 00	255 80	153 00	171 40	182 50
London (c i f shipping current or following month £ per long ton)								
La Plata	17-5-0	16-17-6	16-0-0	16-0-0	15-17 3	11 4-8	11 19-6	12-2-3
Bombay	20-10-0	18-10-0	18-15 0	18-10-0	18-14-0	12 15-4	13 8 3	14-10 3
Duluth No 1 Northern (futures cents per 56 lb) (1)	203 1/4	200 1/4	196	200	199 1/4	173 1/4	193 1/4	172 1/4
Minneapolis No 1 Northern (cts p 56 lb)	214	202 1/4	199 1/4	208	209	184 3/4	199 3/4	180

* Indicates that the product was not quoted during part of the period under review — n q = not quoted — n = nominal — (a) Thursday prices — (b) Saturday prices

(1) Oats August July, maize May April — (2) London Standard — (3) Quotations refer to May futures from January to May, to July futures in June and July, to September futures in August and September, and to December futures during the other months — (4) March 15 37 1/4 — (5) Fixed maximum prices prices of seed oats, which are not under control are much higher — (6) Shipping May, f o b Montreal — (7) Shipping New crop — (8) New crop shipping April — (9) Shipping April May — (10) From Nov 10 1939 to March 15 1940 43 30

DESCRIPTION	April	April	March	March	Average				Commercial Season ⁽¹⁾	
	12	5	29	21 OF 22	March	April	April			
	1940	1940	1940	1940	1940	1939	1938		1938-39	1937-38
Cottonseed.										
Alexandria (a) (piastres per ardeb).										
Upper Egyptian	65.2	65.0	63.0	64.6	63.7	49.0	51.6	57.7	55.3	
Sakellariadis	63.5	63.5	63.2	64.7	63.1	45.3	47.0	54.3	50.7	
London: Egyptian (c.i.f., shipping current of following month, £ per long ton)	8-12-6	8-10-0	8-10-0	8-10-0	8-10-6	5-11-3	5-11-0	6-3-5	6-1-6	
Cotton.										
New Orleans: Middling (cents p lb.)	n. 10.55	n. 10.47	n. 10.37	n. 10.40	n. 10.46	8.61	9.85	8.75	8.87	
New York: Middling (cents per lb.)	n. 10.89	n. 10.85	n. 10.79	n. 10.84	n. 10.94	8.87	8.78	9.00	8.75	
Bombay (rupees p. 784 lb.):										
Broach, f.g. (futures) ⁽¹⁾	¹⁾ 262-0	¹⁾ 243-0	243-0	253-12	257-6	* 151-15	160-15	* 156-2	* 166-11	
Broach, f.g. (spot)	252-0	232-0	243-0	244-0	256-3	155-12	162-10	* 156-6	* 162-9	
Oomra, fine (spot)	235-0	216-0	223-0	224-0	231-13	143-8	147-3	* 148-12	* 148-13	
Alexandria (a) (talariis per kantar):										
Sakellariadis, f.g.f.	19.97	19.65	19.70	19.70	19.76	11.25	12.79	12.37	14.19	
Giza 7, f.g.f.	18.07	17.87	18.22	18.12	18.06	10.98	12.26	12.34	12.81	
Ashmuni, f.g.f.	18.37	18.12	17.92	17.92	17.82	9.10	10.14	10.16	10.62	
Liverpool (pence per lb.):										
Middling, super good	n. 8.72	n. 8.44	n. 8.30	n. 8.15	n. 8.39	5.66	5.67	5.88	5.79	
Middling	8.12	7.84	7.70	7.55	7.79	4.96	4.87	5.17	4.97	
Sao Paulo, g.f.	n. 8.37	n. 8.09	n. 7.95	n. 7.85	n. 8.06	4.96	5.07	5.14	5.16	
Broach, good staple, f.g. ⁽¹⁾	n. 7.06	n. 6.81	n. 6.85	n. 6.75	n. 6.95	3.78	3.93	* n. 3.92	n. 4.04	
C.P. Oomra, good staple, superfine ⁽¹⁾	7.18	6.93	6.97	6.87	7.04	4.17	4.17	* 4.11	4.29	
Giza 7, f.g.f.	10.61	10.39	10.52	10.56	10.49	6.53	7.06	7.22	7.42	
Upper Egyptian, f.g.f.	10.64	10.39	10.33	10.39	10.24	5.59	5.83	6.00	6.31	
Butter.										
								1939	1938	
Köbenhavn (a): Danish, for export (crowns per quintal)	n q	252 00	225.00	230.00	239 50	225 50	218 50	239.00	230.49	
Leeuwarden, Commission for butter quotations (a): Dutch, for export (cents per kg) ⁽¹⁾	80	81	81	81	80 ¹⁾	74 ¹⁾	86 ¹⁾	77 ¹⁾	80 ¹⁾	
Antwerpen, auction: Belgian (frs p. kg)	23.75	28.25	28.60	25.20	24.25	19.62	21.82	20.70	23.30	
New York (b) 92 score, creamery (cents per lb.) . . . . .	...	28 ¹⁾	28 ¹⁾	28 ¹⁾	28 ¹⁾	23 ¹⁾	27 ¹⁾	26 ¹⁾	28	
Cheese.										
Roma: Roman Pecorino, choice (lire per quintal)	1,210.00	1,210.00	1,210.00	1,210.00	1,210.00	1,100.00	1,032.00	1,110.25	1,058.30	
Alkmaar: Edam 40+, National Mark, factory cheese, small (florins p. 50 kg.)	18.25	18.75	19.25	19.50	22.25	16.56	19.60	19.35	21.33	
Gouda: Gouda 45+, National Mark, farm made, 1st quality (florins p. 50 kg.)	24.50	24.50	25.50	n. q.	* 30.00	21.12*	22.56	26.52	25.72	
Eggs.										
Antwerpen, auction: Belgian, average quality (frs. per 100)	50.00	48.00	45.00	47.00	56.20	44.00	40.00	56.00	58.80	
Denmark (c): Danish for export (crs. per quintal)	50.00	96.00	100.00	120.00	116.00	83.60	73.00	112.53	116.70	
Apeldoorn (d): Dutch, average quality 57/58 gr. each (fl. per 100) . . . . .	...	...	..	..	...	3.37	2.84	3.85	3.85	
Barneveld (a): Dutch, average quality 57/58 gr. each (fl. per 100) . . . . .	...	...	...	...	...	3.41	2.87	3.94	3.90	

* Indicates that the product was not quoted during part of the period under review. — n. q. = not quoted. — n. = nominal. — (a) Thursday prices — (b) Wednesday prices. — (c) Average prices for weeks commencing on Thursdays. — (d) Prices on following Mondays.

⁽¹⁾ Cottonseed: Sept.-August; cotton: August-July. — ⁽²⁾ Quotations refer to April-May futures during the period September-May following, and to July-August futures during the other months. — ⁽³⁾ As from March 15, 1939: "fair staple". — ⁽⁴⁾ For home prices these quotations must be increased by a consumption tax which, as from Oct. 19, 1939, amounts to 80 cents per kg. — ⁽⁵⁾ July-August futures

AVERAGE MONTHLY PRICES BY COUNTRIES (1)

GROUPS	DESCRIPTION	AVERAGE						Agricultural year (2)	
		March	Feb.	Jan	Oct.	Jan.	Jan.	1938-39	1937-38
		1940	1940	1940	Dec 1939	March 1939	March 1938		

GERMANY (Prices in Reichsmarks per quintal)

A I	†Wheat (Berlin)	21.00	20.80	20.60	20.20	20.90	20.80	20.56	20.52
	†Rye (Berlin)	19.30	19.10	18.90	18.50	19.17	19.00	18.81	18.69
	†Barley, feeding (Berlin)	17.70	17.60	17.40	17.00	17.37	17.37	17.08	16.99
	†Oats (Berlin)	17.60	17.50	17.40	17.20	17.70	17.20	17.51	16.87
	‡Potatoes, red (Berlin)	5.20	4.90	4.70	4.37	4.93	4.90	5.02	4.91
A II	Hops (Nurnberg) . . . . .	...	476.00	460.00	455.00	533.33	424.00	493.45	437.33
	†Oxen, live weight (Berlin) . . . . .	...	85.20	87.00	88.33	85.60	82.67	86.35	84.15
	Calves, live weight (Berlin)	95.40	95.40	95.40	94.80	95.40	92.60	95.40	93.98
	†Pigs, 220-265 lb., live weight (Berlin)	104.00	104.00	104.00	105.00	100.00	100.00	101.67	101.88
	Milk, fresh (Berlin) per hectolitre	n. q.	n. q.	n. q.	n. q.	16.62	15.60	16.11	15.35
	†Butter, National Mark	301.00	274.00	274.00	274.00	274.00	260.00	257.68	260.00
	Creamery butter	285.60	260.00	260.00	260.00	260.00	246.00	271.69	246.00
	†Cheese, Emmenthal type (Kempten)	180.36	166.00	166.00	166.00	160.00	160.00	160.00	160.00
	Soft cheese, 20 % butterfat (Kempten)	64.56	58.00	58.00	58.00	58.00	58.00	58.00	58.00
	†Eggs, aver. size, marked "G.I.B." (Berlin) per 100	10.50	10.50	12.10	11.50	10.84	10.25	10.35	10.08
B I	§Basic slag, 16 % (Aachen) (4)	0.193	0.193	0.192	0.193	0.220	0.220	0.214	0.212
	§Superphosphate of lime, 18 % (2-4)	0.314	0.314	0.307	0.304	0.312	0.312	0.309	0.309
	§Potash salts, 40 % (4)	5.24	5.24	5.24	5.08	5.24	5.24	5.05	5.05
	§Sulphate of ammonia, 21 % (2-4)	0.480	0.480	0.470	0.450	0.477	0.477	0.457	0.457
	Wheat-bran (Hamburg)	12.25	12.25	12.25	12.25	12.25	12.25	12.25	12.25
B II	Linseed cake (Hamburg)	n. q.	n. 16.25	16.25	16.25	16.25	16.30	16.25	16.25
	Coconut cake (Hamburg)	n. q.	n. 14.65	14.65	14.65	14.65	14.70	14.65	14.65
	Groundnut cake (Hamburg)	n. q.	n. 15.75	15.75	15.75	15.75	15.80	15.75	15.75
	Crushed soya extraction residue (Hamburg)	n. q.	n. 15.45	15.45	15.45	15.45	15.50	15.45	15.45

BELGIUM (Prices in Belgian francs per quintal)

A I	Wheat (Antwerpen)	158.40	151.25	147.75	142.70	122.45	136.75	123.80	136.55
	Rye (Antwerpen)	143.60	133.50	n. q.	118.35	n. q.	126.40	n. q.	126.00
	Barley (Antwerpen)	173.20	170.75	n. q.	157.60	n. q.	125.85	n. q.	126.10
	Oats (Antwerpen)	129.00	118.25	117.25	95.65	84.85	120.00	90.60	119.65
	§Potatoes (Leuven)	50.00	47.50	38.75	33.00	32.90	37.85	35.15	45.30
A II	Flax, fibre (Gent)	3,300.00	3,237.50	3,300.00	2,095.85	1,679.15	1,650.00	1,702.15	1,702.00
	Oxen, live weight (Curegem-Anderlecht)	556.00	526.00	533.00	487.35	505.35	537.35	510.00	523.10
	Calves, live weight (Curegem-Anderlecht)	784.00	717.00	814.00	744.35	748.65	873.65	825.00	803.00
	Pigs, live weight (Curegem-Anderlecht)	607.00	592.00	630.00	669.00	745.35	742.00	801.00	677.00
	§Butter (Antwerpen)	2,425.00	2,449.00	2,455.00	2,241.65	2,391.65	2,442.00	2,272.00	2,354.00
	§Eggs (Antwerpen) per 100	56.20	80.50	61.00	71.25	49.25	51.25	57.85	57.40
	§Basic slag, 15-20 % (Charleroi) (4)	1.20	1.20	1.48	1.84	1.96	1.55	1.95	1.52
	Superphosphate of lime, 14 % (producer's store) (4)	3.40	3.40	3.20	2.50	2.50	2.50	2.50	2.41
	Sylvinite-Kalinite, minimum 14 %	29.25	29.25	29.25	28.60	29.50	29.50	28.65	29.00
	§Nitrate of soda, 15 1/2 % (4)	112.25	111.25	110.25	111.25	112.25	114.90	110.90	113.75
B II	§Sulphate of ammonia, 20 % (4)	105.00	96.00	95.00	96.00	99.00	99.65	95.65	98.50
	Maize, Plata (Antwerpen)	147.70	131.25	125.25	120.25	85.45	111.40	85.70	103.55
	Linseed cake imported	* 167.00	160.50	164.50	140.50	114.00	124.10	114.60	117.85
	Coconut cake imported	* 156.00	140.00	138.00	* 136.75	94.50	117.00	100.35	116.25
	Groundnut cake imported	* 170.00	153.00	153.00	139.65	100.85	112.15	102.20	* 111.00

* Indicates that the product was not quoted during part of the period under review. — † Indicates that the series is published in the *International Yearbook of Agricultural Statistics* and used in the table of average monthly prices in gold francs per quintal. — § Indicates that the series is published in the *International Yearbook of Agricultural Statistics*.

(1) Prices, for several countries, of plant (A I) and animal (A II) products sold by the farmer; also of fertilizers (B I) and concentrated feedstuffs (B II) bought by the farmer, are published quarterly (Jan., April, July and Oct.). In cases where the market is not indicated, the price is the average for the whole country. — (2) July to June. — (3) Prices per kg. of active fertilizer contained in 100 kg. of commercial fertilizer. — (4) Free at buyer's station. — (5) Before 1940, bagged; subsequently: bulk.

GROUPS	DESCRIPTION	AVERAGE						Agricultural year	
		March	Feb.	Jan.	Oct.	Jan.-	Jan.-	1938-39	1937-38
		1940	1940	1940	Dec. 1939	March 1939	March 1938		
DENMARK (Prices in Danish crowns per quintal)									
A I	Wheat (Köbenhavn)	19.12	19.18	19.15	18.46	14.18	17.85*	14.34	18.06
	Barley (Köbenhavn)	17.50	17.40 *	17.30	17.69	11.66	17.49	12.12	17.26
	Oats (Köbenhavn)	17.50	17.40	17.30	18.36	11.86	15.78	12.14	15.93
A II	§Cows, live weight (Köbenhavn)	53.75	56.00	48.80	47.42	43.57	40.25	42.63	40.36
	†Pork, dead weight	168.00	191.00	200.00	179.33	174.93	175.20	171.27	177.16
	Fresh milk	16.75	16.75	16.75	14.82	14.28	14.37	14.23	13.85
	†Butter (Köbenhavn)	239.50	279.60	285.50	250.87	255.65	223.33	237.95	235.55
	Whole milk cheese (Odense)	170.00	170.00	167.50	151.33	133.33	140.00	137.60	133.30
	†Eggs, for export.	116.00	129.50	122.00	157.17	92.53	106.23	112.26	119.37
B I	§Superphosphate, 18 %	n. q.	n. q.	n. q.	n. q.	6.77	6.77	6.62	6.61
	Potash salts, 40 %	n. q.	n. q.	n. q.	n. q.	13.78	13.78	13.49	13.49
	Sulphate of ammonia, 20.8 %	n. q.	n. q.	n. q.	n. q.	16.75	16.75	16.57	16.50
	§Nitrate of lime, 15 1/4 %	n. q.	n. q.	n. q.	n. q.	16.70	16.70	16.52	16.45
B II	Rye, imported (Jutland)	n. q.	20.25	20.70	20.52	14.36	17.81	14.48	17.81
	Maize, Plata (Jutland)	* 18.00	* 18.00	20.00	20.00	15.48	16.99	15.35	16.13
	Wheat-bran, Danish (Köbenhavn)	* 18.60	n. q.	n. q.	* 18.01	10.29	15.12	11.26	14.89
	Cottonseed cake (Köbenhavn)	25.40	24.85	24.90	24.92	14.50	15.86	14.66	16.24
	Sunflower-seed cake (Köbenhavn)	n. q.	n. q.	24.80	24.55	15.30	16.47	15.70	17.01
	Groundnut cake (Köbenhavn)	27.10	26.80	27.12	27.05	15.44	16.85	16.04	17.26
	Crushed soya extraction residue (Köbenhavn)	26.20	25.95	25.80	* 25.95	15.82	17.01	16.35	17.24

ITALY (Prices in lire per quintal)

A I	†Wheat, soft (Milano)	155.75	153.80	148.00	148.00	148.00	138.00	148.00	138.85	
	Wheat, hard (Catania)	164.75	162.80	157.00	157.00	157.00	147.00	157.00	148.40	
	Oats (Milano)	147.50	147.50	147.50	114.15	97.65	99.90	97.05	101.00	
	†Maize (Milano) ⁽¹⁾	110.15	109.60	108.00	108.00	90.00	83.30 *	90.00	84.35	
	Rice, Vialone (Milano)	280.30	277.20	271.00	269.40	250.00	240.65	249.30 *	227.80	
	Rice, Maratelli (Milano)	214.90	211.90	206.00	204.40	195.00	184.85	193.60 *	180.20	
	†Rice, Originario (Milano)	183.80	180.85	175.00	173.40	163.00	152.90	163.45	149.90	
	§Hemp, fibre ⁽¹⁾	590.00	590.00	590.00	590.00	590.00	590.00	590.00	582.35	
	§Olive oil "Soprafino locale" (Bari)	863.25	853.10	812.00	789.65	721.35	669.65	712.00	699.00	
	§Wine, ordinary, 1 st (Bari) per hectolitre ⁽¹⁻⁴⁾	196.00	170.10	146.50	106.00	107.50	117.60	97.55		
A II	§Oxen, live weight, 1st quality (Milano) ⁽¹⁾	545.00	500.00	500.00	489.90	468.40	490.90	458.30	462.10	
	Lambs, dead weight (Roma) ⁽¹⁾	924.00	869.50	814.75	708.05	679.40	768.65	725.85	791.60	
	Pigs, live weight (Milano) ⁽¹⁻⁴⁾	740.00	680.00	680.00	667.90	524.65	608.35	537.50	599.50	
	†Cheese, Parmigiano-Reggiano (Milano)	1,371.90	1,345.00	1,295.00	1,185.00	1,181.65	1,150.00	1,205.75	1,100.00	
	Eggs (Milano) per 100 ⁽¹⁾	59.75	80.00	78.10	71.65	50.70	45.05	53.20	49.45	
	Wool, «Roma 2, vissana» (Roma) ⁽¹⁾	2,602.00	2,602.00	2,602.00	2,602.00	2,602.00	2,602.00	2,602.00	2,602.00	
B I	§Superphosphate of lime, 14-16 % (Milano) ⁽¹⁾	29.11	n. q.	n. q.	24.75	24.75	24.75	24.75 *	24.35	
	Chloride of potash, 50 % (Milano) ⁽¹⁾	79.50	74.50	74.50	74.25	71.50	72.20	71.50	71.10	
	§Nitrate of lime, 15-16 % (Milano) ⁽¹⁾	100.40	n. q.	n. q.	83.80	94.15	95.40	92.35	92.15	
	Sulphate of ammonia, 20-21 % (Milano) ⁽¹⁾	95.10	n. q.	n. q.	80.80	90.15	90.60	88.10	87.75	
	§Cyanamide of calcium, 15-16 % (Milano) ⁽¹⁾	77.25	n. q.	n. q.	64.30	72.25	73.15	70.40	70.15	
	§Copper sulphate, 98-99 % (Genova) ⁽¹⁾	231.50	230.50	229.50	n. q.	185.50	199.50	189.30	198.00	
B II	Wheat-bran (Milano)	62.85	62.05	60.00	60.00	60.00	60.00	60.00	57.15	
	Rice-bran (Milano)	83.00	82.25	80.00	80.00	80.00	60.50	74.35	58.75	
	Linseed cake (Milano) ⁽¹⁻⁴⁾	81.00	81.00	81.00	81.00	81.00	85.50	81.00	85.50	
	Groundnut cake (Milano) ⁽¹⁻⁴⁾	65.00	65.00	65.00	65.00	65.00	55.00	62.00	55.00	
	Rapeseed cake (Milano) ⁽¹⁻⁴⁾	36.00	36.00	36.00	36.00	36.00	36.50	36.00	36.50	

* , †, §: see notes on page 72.

⁽¹⁾ The 2 per cent. sales tax, levied as from February 8, 1940, is not included. — ⁽²⁾ As from July 1939: prices in Barletta for wine 14°. — ⁽³⁾ Prior to Feb. 1938, pigs weighing more than 150 kg.; subsequently, pigs of more than 180 kg. — ⁽⁴⁾ Linseed cake and rapeseed cake, as from July 1938, and groundnut cake, as from Jan. 1938: prices free at factory.

GROUPS	DESCRIPTION	AVERAGE						Agricultural year	
		March	Feb	Jan.	Oct -	Jan -	Jan	1938-39	1937-38
		1940	1940	1940	Dec 1939	March 1939	March 1938		
SWEDEN (Prices in Swedish crowns per quintal)									
A I	Wheat (Stockholm)	20.78	20.53	20.21	19.54	17.39	20.45	* 17.36 *	20.15
	Rye (Stockholm).	20.90	20.59	20.40	19.55	16.62	18.88	* 16.66 *	18.79
	Barley . . . . .	...	17.75	17.68	17.40	13.30	18.00	* 13.44 *	17.97
	Oats (Stockholm)	17.90	17.44	16.15	15.04	11.14	14.96	* 11.40 *	14.68
A II	Cows, live weight (Stockholm) . . . . .	...	...	72.00	71.00	63.00	57.67	63.17	59.10
	Pigs, live weight (Göteborg) . . . . .	...	...	104.00	104.67	105.33	98.33	102.58	98.40
	Butter (Malmö; prices for the home market)	300.00	300.00	300.00	300.00	275.00	275.00	271.08	267.96
	Butter (Malmö; prices for export) . . . . .	...	...	230.00	214.33	221.67	193.33	206.60	206.30
	Eggs (Stockholm)	157.50	155.00	150.00	178.67	174.00	133.95	135.92	137.20
B I	Superphosphate, 20 %	9.80	9.80	9.80	n q	7.30	7.55	7.25	7.37
	Potash salts, 40 %	15.60	15.60	15.60	n q	12.55	13.10	12.32	12.72
	Nitrate of soda, 15 1/4 % - 16 %	18.90	18.90	18.90	n q	17.25	17.65	17.45	17.39
	Nitrate cyanamide, 15 1/2 %	17.05	17.05	17.05	n q	16.55	16.95	16.75	16.61
B II	Maize, Plata.	18.50	18.50	18.25	20.69	18.15	17.30	17.43	16.92
	Wheat-bran	16.74	16.54	16.17	15.60	12.70	14.26	12.98	14.14
	Groundnut cake	24.50	24.50	24.50	24.50	20.33	19.66	20.14	19.52
	Cottonseed cake	23.00	23.00	23.00	23.00	19.72	18.94	19.53	18.98
	Soya meal	23.00	23.00	23.00	23.00	20.48	19.14	20.35	19.08

* See notes on p. 72.

APPENDIX

THE SECOND WORLD AGRICULTURAL CENSUS

Census of Agricultural holdings in Latvia in 1939.

The Latvian Bureau of Statistics has recently published ⁽¹⁾ the first results of the general agricultural census carried out in Latvia from June 26 to July 9, 1939.

We reproduce here the statistics available, referring to the total number of agricultural holdings and their distribution according to total size, the distribution of agricultural holdings of 1 hectare (2.47 acres) and over according to tenure, the number of members of holders' families, living on holdings of 1 hectare and over, whether working on the holding or not, and the number of agricultural wage labourers employed on holdings of 1 hectare and over.

Number of holdings and distribution according to total size and to tenure. — The total number of agricultural holdings registered in the 1939 agricultural census was 270,604, an increase of 4,941 on the number registered in the 1929 census; 234,604 holdings are situated in rural areas and 36,000 in urban areas.

The distribution of holdings according to size is as follows:

Distribution of Holdings according to total Size.

TOTAL AREA OF HOLDINGS	Number of holdings		Percentage of total	
	1939	1929	1939 %	1929 %
Under 1 hectare	39,808	41,443	14.7	15.6
From 1 to 2 hectares	10,540	12,141	3.9	4.6
" 2 to 5 "	21,431	23,188	7.9	8.7
" 5 to 10 "	42,573	43,814	15.7	16.5
" 10 to 15 "	39,854	36,870	14.7	13.8
" 15 to 20 "	38,360	35,875	14.2	13.5
" 20 to 30 "	37,226	33,080	13.8	12.4
" 30 to 50 "	24,972	23,632	9.2	8.9
" 50 to 100 "	14,732	14,886	5.5	5.6
Over 100 hectares.	1,108	1,184	0.4	0.4
<i>Total</i>	<i>270,604</i>	<i>266,113</i>	<i>100.0</i>	<i>100.0</i>
Holdings of 1 hectare and over	230,796	224,670	85.3	84.4

⁽¹⁾ Latvian Bureau of Statistics: *Bulletin mensuel Statistique et Conjoncture*; XVth Year, No. 3, Riga, 1940.

In the decade 1929 to 1939, there was an increase in the number of average-sized holdings, of from 10 to 50 hectares (24.7 to 123.6 acres) in size, from 129,457 to 140,412 and a decrease in the number of smallholdings (under 10 hectares) and of large holdings (over 50 hectares), which fell respectively from 120,586 to 114,352 and from 16,070 to 15,840.

The greater part of the holdings under 1 hectare in size—75.5 per cent. of the total—are situated in urban areas.

The statistics given on the distribution of holdings according to the mode of tenure relate only to holdings of 1 hectare and over.

Distribution of Holdings of 1 hectare and over according to Tenure.

CLASSIFICATION	Number of holdings		Percentage of total	
	1939	1929	1939 %	1929 %
Holdings farmed by the owners	200,305	190,886	86.8	84.9
Leased holdings	20,763	16,642	9.0	7.4
Metavage holdings	3,616	3,375	1.6	1.5
Other holdings	6,092	13,767	2.6	6.2
<i>Total</i>	230,796	224,670	100.0	100.0

Members of the family of the holder, living on the holding, whether working on the holding or not, and wage labour. — The statistics given in the 1939 census show that the greater part of the labour on holdings of 1 hectare and over is provided by the members of the families of holders. About 58 per cent. of such members of families are permanently employed in agricultural work, while 16 per cent. take part temporarily or are engaged in herding livestock. The number of agricultural wage labourers, including day-labourers, only represents a little over one-fifth of the total number of the members of families assisting in the work on holdings.

Members of the Families of Holders living on Holdings of one hectare and over, whether working on holdings or not.

CLASSIFICATION	Men	Women	Total
Persons permanently occupied	258,282	312,791	571,073
Persons temporarily occupied (excluding those engaged in stock herding)	56,401	41,501	97,902
Persons engaged in stock herding only	29,593	26,729	56,322
<i>Total members of holders' families occupied on holdings in agricultural work</i>	<i>344,276</i>	<i>381,021</i>	<i>725,297</i>
Members of holders' families, living on holdings, but not occupied in agricultural work	121,577	128,762	250,339
<i>Total members of holders' families living on holdings</i>	<i>465,853</i>	<i>509,783</i>	<i>975,636</i>

Of a total of 230,796 holdings of 1 hectare and over, only 74,437, or 32.3 per cent., hire paid labourers; on 19,562 of these holdings the wage labour consists solely of persons charged with stock herding.

Wage Labour on Holdings of 1 hectare and over.

CLASSIFICATION	Men	Women	Total
Annual labourers (1) number paid in kind)	20,352 (6,424)	25,184 (3,435)	45,536 (9,859)
Seasonal labourers	22,661	27,200	49,861
Monthly labourers	3,168	3,293	6,461
Stock herders	19,655	18,509	38,164
Day labourers	8,882	10,701	19,583
<i>Total</i>	<i>74,718</i>	<i>84,887</i>	<i>159,605</i>

(1) Including managing and technical staff

Prof. UGO PAPI, *Segretario generale dell'Istituto, Direttore responsabile.*

MONTHLY CROP REPORT AND AGRICULTURAL STATISTICS

The following explanations refer to crop conditions quoted in the crop notes and in the tables. — (crop condition according to the system of the country: Germany, including Ostmark and Sudetenland, Bohemia and Moravia (Protectorate); Hungary and Luxemburg: 1 = excellent, 2 = good, 3 = average, 4 = poor, 5 = very poor; Finland: 8 = very good, 6 = above the average, 5 = average; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = poor; Estonia, Latvia, Lithuania, Poland, Romania and Sweden: 5 = excellent, 4 = good, 3 = average, 2 = poor, 1 = very poor; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; Portugal: 100 = excellent, 80 = good, 60 = average, 40 = poor, 20 = very poor; Switzerland: 100 = excellent, 90 = very good, 75 = good, 60 = fairly good, 50 = average, 40 = rather poor, 30 = poor, 10 = very poor; U. S. S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = poor; Canada: 100 = crop condition promising a yield equivalent to the average yield of a long series of years; United States: 100 = crop condition which promises a normal yield, Egypt: 100 = crop condition which promises a yield equal to the average yield of the last five years. — For other countries the system of the Institute is employed 100 = crop condition which promises a yield equal to the average of the last ten years

NOTE: The countries are listed throughout by continents (Europe, followed by the U. S. S. R., America, Asia, Africa and Oceania) in the French alphabetical order. In the tables the Northern Hemisphere precedes the Southern Hemisphere.

VEGETAL PRODUCTION

THE CONDITION OF THE STANDING CROPS

When summarizing the information on the condition of the wheat crops in Europe in last month's Crop Report, we remarked that the situation was on the whole somewhat unfavourable for, in addition to damage by frost and floods, growth was appreciably late in nearly all parts, and very favourable weather at the end of the season was necessary to ensure good yields. Thus, the general outlook at mid-April was not hopeful and pointed to a wheat crop much smaller than that of last year.

Conditions between mid-April and mid-May were favourable in all parts of the continent. Temperatures rose gradually without sudden changes; sunshine predominated though there were intervals of well distributed rain. Growth recovered vigorously and made up for the delay reported last month in nearly all parts. Further, damage caused by the severe weather of the winter was not as serious as was expected, the crops having vigorously resisted the frosts, owing to the good snow cover. Flooding caused less damage than was at first feared. In short, the situation at the middle of May had improved considerably and gave promise of a production little below that of last year in most parts of Europe. There is some danger, however, that this improvement may be offset by the loss and damage resulting from the extension of the war operations to areas where normally unit yields are the highest in Europe.

In the Soviet Union, there were sudden changes in temperature at the beginning of spring and during May. Rains however, were frequent and well

distributed, especially in southern regions, and the situation at the beginning of May was considered generally satisfactory. Spring sowings, which had been held up or retarded, made good progress and by the first of May the delay, as compared with the situation last year, had been almost wiped out.

In the United States, winter wheat prospects, which were very poor at the end of autumn, owing to a long drought, improved appreciably during the winter and, in particular, during recent months. The first indication on the size of the winter wheat crop of 1940, made in December 1939, pointed to a crop of 399 million bushels; this figure was raised to 426 million bushels on April 1 and to 460 million bushels on May 1. Even after these increases, the 1940 crop is rather poor for it is 18 per cent. below the 1939 outturn, which was practically equal to the average of the preceding five years. In the first half of May, conditions were generally favourable for crop growth, though some areas were too cool and others too dry, the few showers which fell in the most droughtstricken areas being insufficient for the needs of growth. Conditions were particularly favourable for the spring crops, the sowings of which were practically finished. The enquiry on farmers' sowing intentions indicated that the area sown to spring wheat in 1940 would be about 11 per cent. larger than the area actually shown in 1939. With normal yields, an area of this size would produce about 210 million bushels. The total wheat production of the United States should therefore reach, according to these forecasts, about 670 million bushels. This quantity would cover internal requirements and leave a small surplus for export.

In Canada, where sowings progressed at a good rate, farmers intended to cultivate about 27.5 million acres, or about 6 per cent. more than last year. If these intentions are realized, the area in Canada will be the largest hitherto recorded, the previous highest being acres 26.6 million in 1932. Moisture reserves, which are essential for the germination of the crops, are rather reduced this year, but the spring began with frequent and copious rains and this may offset the handicap of poor reserves; the crops, however, will need heavier rains in June. With average yields the 1940 area should produce about 400 million bushels, against 490 million in 1939, an exceptional year, and a five-year average of 248 million bushels.

Harvesting is practically finished in India and the first estimate of production issued last month indicated a crop of 390 million bushels, against a corresponding estimate of 344 million last year. A revised estimate just issued by the Government of India points to a crop of 398 million bushels, against a corresponding estimate of 367 bushels for last year. As conditions have been favourable also in the late ripening areas, the final estimate will probably exceed 400 million bushels, against 371 million, the final figure for 1939. India, which normally exports wheat only when prices are favourable, will have an unusually large export surplus this year.

In North Africa, crop prospects are still good and point to a production appreciably above the average. The outlook is similar in the Near East and in most of the countries of the Far East.

Conditions were favourable for sowings in Argentina, where an appreciable increase in the cultivated area is expected; the season has been fairly favourable also in Australia, but rains were light in Western Australia.

The increasing scarcity of official data on foreign trade renders it impossible to continue publication of the table on international wheat movements, the few figures which have been received by the Institute are produced on page 379.

G. C.

CURRENT INFORMATION FROM VARIOUS COUNTRIES ON WHEAT, RYE, BARLEY AND OATS.

Spain: According to press reports the condition of winter crops, especially wheat, was excellent in April in central and southern Spain. Winter rains in the principal cereal regions had a favourable influence on crops. The campaign against grasshoppers has given very satisfactory results.

Finland. The temperature during April was above normal

France. On May 15 the crop condition of cereals generally and of wheat in particular was satisfactory (*Bulletin des Halles*).

Hungary: During the three weeks April 17 to May 8 the weather was at first exceptionally warm, dry and sunny, whereas later it was rather cool and wet. The amount of precipitation was generally above average. The fine spell was favourable for crops, but the cold spell hampered flowering and the sowing of spring crops. The cold weather also checked growth. Low-lying lands were again covered with water. Owing to the damage done to winter crops by floods, large areas had to be re-ploughed.

Early sown winter wheat and rye are on the whole in good condition, late sown crops from, however, have not made much growth and have suffered from the pressure of snow and from frosts. Winter barley has undergone very serious damage in most parts of the country. About 40 to 70 per cent. of the area under winter barley has had to be ploughed under. Winter oats were very much damaged throughout the country.

On May 8 the crop condition of winter wheat was above average in 6 departments, average in 17 and below average in 11. The corresponding figures for winter rye are above average in 5, average in 19 and below average in 10 departments.

The sowing of spring cereals was not finished on May 8. Crops were in need of greater warmth.

(Telegram of May 28) Winter wheat and rye are backward, thin and weed-intested. Spring wheat and rye germinated well. Yields of all cereals are expected to be below the average.

Ireland: The weather during April was comparatively mild with intermittent rainfall, with the exception of a cold spell of three or four days at the middle of the month, when there was snow and a light frost. Sowing was carried out under fairly favourable conditions and on May 1 had been almost completed. Winter wheat was doing well.

Lithuania: The crop condition of winter wheat at the beginning of May was 86.0 in the system of the Institute, against 100 at the corresponding date of last year (2.0 in the system of the country, against 3.0), corresponding figures for winter rye are 100 and 110 (3.0 and 3.3).

Netherlands Winter cereals have suffered on the whole from the severe and prolonged cold which continued after the end of the winter and from the exceptionally heavy rainfall. Winter wheat has suffered from these adverse conditions particularly in the north where most of the wheat is grown. Rye was, on the whole, a rather better crop than wheat although in the lower lying districts the excessive moisture caused considerable damage. Winter barley was most affected by the conditions.

Crop condition in the system of the country in the third decade of April was as follows compared with April 1939 in brackets: winter wheat 54 (50) rye 59 (66), barley 47 (30).

Portugal The crop condition of cereals at the end of the winter was poor in the principal producing areas owing in particular to excessive rain. To improve the condition of winter wheat and other winter cereals very favourable conditions during the spring were necessary.

Romania The weather in April and the first half of May was very unfavourable for winter crops and for ploughing and sowing of spring crops. At the middle of May winter wheat crops were being menaced by rust owing to the excessive moisture. The severe and prolonged winter frosts did much damage to winter wheat. Consequently a poor harvest is forecast and the Government has forbidden wheat exports after May 3.

Areas sown to cereals

COUNTRIES	WHEAT				RYE			
	1940	1939	Average 1934 to 1938	1940	1940	1939	Average 1934 to 1938	1940
	000 acres	000 acres	000 acres	1939 = 100	000 acres	000 acres	000 acres	1939 = 100
WHEAT								
Greece	2 557	2 320	2 059	110.2	124.2	151	155	173
Lithuania	346	364	381	94.9	90.7	1,248	1,222	1,246
Luxembourg	35	38	45	91.1	76.2	16	18	18
Romania	7,798	9 558	7 809	81.6	99.9	853	1 086	1 015
Canada	1) 711 2) 735 3) 27 535	1) 735 2) 26 021 3) 37 802	1) 590 2) 24 451 3) 40 498	96.7 105.8 90.1	120.5 112.6 84.1	1) 738 2) 209 3) 3 214	1) 891 2) 211 3) 3 363	1) 565 2) 168 3) 84.3
United States	1) 34 076 2) 17 532 3) 19 425	1) 37 802 2) 17 532 3) 22 304	1) 40 498 2) 22 304 3) 22 304	90.1 110.8 87.1	84.1 87.1 87.1	1) 3 214 2) 3 811 3) 3 363	1) 891 2) 211 3) 3 363	1) 565 2) 168 3) 84.3
India (4)	33 666	34 941	34 585	96.4	97.3	—	—	—
Egypt	1 560	1 501	1 452	103.9	107.4	—	—	—
BARLEY								
Greece	493	518	517	95.2	95.4	382	326	343
Romania	226	256	196	88.1	115.2	—	—	—
Canada	3) 4 484	3) 4 347	3) 4 144	103.1	108.2	3) 12 880	3) 12 790	3) 13 435
United States	3) 14 606	3) 14 546	3) 11 912	100.4	122.6	3) 35 818	3) 35 512	3) 38 421
Egypt	272	273	280	99.7	97.0	—	—	—
OATS								
Greece	493	518	517	95.2	95.4	382	326	343
Romania	226	256	196	88.1	115.2	—	—	—
Canada	3) 4 484	3) 4 347	3) 4 144	103.1	108.2	3) 12 880	3) 12 790	3) 13 435
United States	3) 14 606	3) 14 546	3) 11 912	100.4	122.6	3) 35 818	3) 35 512	3) 38 421
Egypt	272	273	280	99.7	97.0	—	—	—

u) Winter crops — s) Spring crops 1) Area indicated for harvest — 2) Area harvested — 3) Farmers intentions to plant — 4) Fourth estimate

Switzerland A spell of fine weather in the second half of April stimulated the growth of crops which was still retarded. Winter cereals have not yet recovered from the damage of the winter and many thin crops may be observed. Wheat is the worst of the winter crops. Winter rye, spelt and meslin have improved somewhat since

April. Spring sowings were rather late but took place in good conditions. Germination was normal and growth so far satisfactory.

The following is a list of the various crop condition figures, in the system of the country, expressed as a percentage of a very good crop:—

	I V-1940	I-IV-1940	I-V-1939
Winter wheat	61	63	84
Spring wheat	77	—	81
Spelt	66	64	85
Winter rye	65	59	82
Spring rye	77		78
Meslin	65	63	83
Winter barley	67	64	85
Spring barley	77	-	79
Oats	80	—	81

Yugoslavia: The first half of April was rather wet, particularly the northwest, so that the level of the rivers remained very high. Only towards the end of the first half of the month did the level of the rivers begin to drop and floods to cease. The second half of the month was on the whole fine and dry and much warmer. Towards the end of April and at the beginning of May the weather became wet again and cooler with cold winds. Despite the gravity of the floods, the damage suffered by winter cereals is not very extensive. It is forecast that the area will be about 740,000 acres smaller than the area sown in the winter of 1938-39. The largest reduction is in the winter wheat area.

U. S. S. R : There was a sharp change in the weather during the third decade of April, in the European territory of the Union. The warm weather in this area was succeeded by a cold spell, whereas the contrary took place in the southwest. The temperature was above normal in North Caucasus; in the rest of the European territory the temperature was below normal. Frequent precipitation in the form of snow took place in the north and northeast. In several parts of Ukraina there were good rains, as also in North Caucasus, Armenia and Georgia.

In most areas the soil moisture reserves, measured to a depth of 1 metre, varied between 1,400 and 1,600 cubic metres per hectare, whereas in North Caucasus they reached in some parts 2,000 cubic metres. Moisture was much less, however in the Moscow and Ivanovov areas and particularly in the Transvolga; in most of these areas reserves amounted to about 1,000 cubic metres. In the Transvolga region, moisture reserves are found only in the upper soil. Prolonged frost in the northern areas retarded the completion of sowing and the resumption of growth of winter cereals.

At the beginning of May the crop condition of rye and winter wheat was variable in the northwest and in the centre, good or satisfactory in the northeast, in the Volga basin and Ukraina, while it was generally good in the Crimea and North Caucasus.

The sowing of spring cereals made rapid progress in the west but slow progress in the east. The line of spring sowings passed through the south of Leningrad, Yaroslavl and Gorkii. Sowing has also just begun in the western areas of White Russia. In some parts of Ukraina and of the centre spring cereals have germinated and their crop condition is good or satisfactory. In Crimea and North Caucasus spring cereals are in the growing stage and crop condition is good.

In Siberia the weather was variable, a warm spell was succeeded by a cold spell. Precipitation was light. The crop condition of winter cereals in most parts of Siberia was satisfactory at the beginning of May. In the Novosibirsk region unfavourable weather conditions, which prevailed during the winter have resulted in an unsatisfactory crop condition. Spring sowings had begun in almost parts.

The sowing of spring crops this year is considerably retarded in most parts compared with last year, particularly in the case of sugar-beet potatoes, flax and other crops. In fact, the area sown to all spring crops on May 1, on collective and State holdings, was 92,527,000 acres, or 45 per cent. of the area fixed by the Plan, against 105,076,000 acres, or 51 per cent. of the Plan sown to the same date last year. For the total of collective holdings the corresponding figures are as follows: 83,153,000 acres, or 44 per cent. of the Plan, against 95,132,000, or 51 per cent. of the Plan.

It should be noted, however, that in collective holdings the area sown to spring cereals was 60,210,000 acres, which is practically the same area as on May 1, 1939, namely 60,274,000

Argentina: The following table shows the third estimates issued on May 21 by the Argentine Government, of 1939-40 grain crops, compared with the final figures for 1938-39 and for the five years ended 1937-38.

	1939 40	1938-39	Average 1933-34/1937-38	¹⁰⁰ / ₁₉₃₈₋₃₉ = 100	¹⁰⁰ / _{Average} = 100
	(000 centals)				
Wheat	71,673	201,724	132,357	35.5	54.2
Rye	7,606	6,063	4,471	125.5	170.1
Barley	18,762	9,700	13,761	193.4	136.3
Oats	19,226	16,094	16,470	119.5	116.7
	(000 bushels)				
Wheat	119,452	336,190	220,591	35.5	54.2
Rye	13,582	10,826	7,984	125.5	170.1
Barley	39,087	20,200	28,668	193.4	136.3
Oats	60,080	50,263	51,468	119.5	116.7

The new estimate of the wheat crop is 860,000 centals (1.4 million bushels) larger than the estimate issued in February. The area cultivated was slightly below the average but the production is the lightest obtained in the last twenty years. The unusually poor results of the year were due almost entirely to damage caused by excessive rain, frost and insect infestation.

Canada: According to the official estimate of farmers' intentions to plant on May 1, the area under meslin in 1940 will be 1,247,000 acres against a harvested area in 1939 of 1,218,100 and an average in 1934 to 1938 of 1,154,300 acres; percentages 102.4 and 108.0

United States (Telegram of May 16): There were rapid fluctuations in temperature and showers in the past week. From the Great Plains eastwards warmth is needed generally and rain in some areas. Winter wheat is progressing well in the eastern belt but is only poor to good in the western. There are good stands of spring wheat in the Dakotas except in the north where seeding is being rushed. Sowings are almost finished in Montana.

The second estimate of winter wheat production in 1940 is higher than the first estimate at 275,815,000 centals (459,691,000 bushels) against 338,059,000 (563,431,000) in 1939 and an average in 1934-1938 of 335,654,000 (559,423,000).

The first estimate of rye production is 20,427,000 centals (36,476,000 bushels) against 21,979,000 (39,249,000) in 1939 and average of 23,115,000 (41,276,000).

Cyprus: The weather was variable during March, ground frosts and heavy rains alternating with hot, dry spells. The rainfall during the month was satisfactorily distributed in the greater part of the Messaoria but the southern part of the Larnaca, Limassol and Paphos districts were comparatively dry.

With the exception of isolated localities and late sown fields, the wheat crop was reported to be good and it was expected that, provided favourable weather conditions prevailed during April, the production would be fair to average.

The barley crop was generally in ear. The straw was short but it was expected that the grain would be of good quality.

The growth of oats was good and it was stated that further rains would produce a good crop.

India: According to a cable received on May 24 from the Government of India, the second estimate of the wheat production of India is 239,100,000 centals (398,500,000 bushels). This is 8.7 per cent. larger than the corresponding estimate for last year 220,010,000 centals (366,690,000 bushels) and 8.9 per cent. larger than the corresponding average for the five years ending 1938: 219,480,000 centals (365,790,000 bushels).

Japan. Following favourable weather, the crop condition of winter wheat and barley at the beginning of May was normal.

Egypt: Maturation of the wheat crop is progressing. Harvesting was started in Upper Egypt about the middle of April, and about 35 per cent. of the crop therein was harvested. In other localities, however, harvesting had begun by the end of the month in only a few areas.

Black rust infested many localities in Lower Egypt, especially in the *hundi* crop. This disease is expected to reduce the crop of Lower Egypt. The damage will appear more clearly during the coming period. The crop in other regions is normal. Crop condition on May 1 was 101, as against 101 on April 1 and 106 on May 1, 1939.

Harvesting of the barley crop was over in Upper Egypt. It is progressing normally in other localities. The crop is slightly above the average. Crop condition 102, 101 and 104.

Union of South Africa: In Cape Province farmers were busy ploughing and sowing winter cereals. Following the good rains in March, prospects were favourable.

CURRENT INFORMATION ON MAIZE.

Hungary: Towards May 8 sowing of maize was only partly completed. Early sown crops have grown well and evenly but the cold weather and the rain hindered their development. In some places the foliage of maize is yellow.

Romania: On May 10, maize sowing was in progress throughout the country. Owing to the reduction in the area under winter cereals and their poor crop condition a strong tendency to increase the maize area this season is noted. Unfavourable weather conditions (excess of moisture and low temperature), however, hamper sowing.

U. S. S. R.: At the end of the second decade of April maize sowing had begun in the south of Ukraina.

Argentina: Maize crops suffered damage in April from rain and strong winds in the south of Buenos Aires Province and in Entre Ríos. A large crop, however, exceeding earlier forecasts is expected in Córdoba and Santa Fe. The first official estimate of production, published on April 12, and giving an exceptionally high figure, remains unchanged. The area abandoned in 1939-40 totals 2 1/2 million acres.

United States (Telegram of May 16): There were rapid fluctuations in temperature and showers during the past week. Maize sowing is progressing favorably except locally.

Union of South Africa: Rains which fell in the latter half of March came too late to save the drought-stricken maize crops in nearly all parts of the Union. Consequently, production will be poor in spite of the comparatively large area sown. Moreover, late frosts did further damage to crops, which have had in many ways one of the worst seasons for many years.

CURRENT INFORMATION ON RICE.

Taiwan: The transplantation of rice was completed regularly and growth was normal at the end of April.

British Malaya: It was reported by the end of February that in north Kedah harvesting was almost complete while considerable areas in the central and south districts remained to be harvested.

In Krian the harvest was in full soving and yields were reported to be better than last year in the south and about the same as last season in the north. Owing to the dry weather ripening had been even and the quality of the grain was stated to be good.

In Perak Central the crop also appeared to be better than last season.

At Sungei Manik harvesting was taking a long time as there was shortage of labour.

The padi crop in Kuala Selangor and Panchang Bedena on account of drought was reported to have been a complete failure with the exception of some 900 acres at Mukim Sempadan where irrigation water is available.

Egypt. Preparation of land for sowing of the summer rice crop was started. Sowing has not commenced except in partial areas in a few localities to provide seedlings for transplantation.

CURRENT INFORMATION ON POTATOES.

Hungary: Preparation of the land and the sowing of potatoes were still continuing on May 8. Early potatoes were sprouting at this date.

U. S. S. R.: In kolkhozi, which normally represent about one half of the potato area in the Union, 441,000 acres, or 5 per cent. of the Plan, had been sown on May 1, against 1,403,000 acres, or 17 per cent., at the same date last year.

Argentina. The yields of early potatoes this season vary considerably from one district to another. The condition of late varieties in April was generally satisfactory in the country as a whole.

Canada According to the official estimate of farmers' intentions to plant on May 1 the area under potatoes in 1940 will be 534 000 acres against a planted area in 1939 of 517 700 acres and an average in 1934 to 1938 of 526 200 acres percentages 103.1 and 101.5

THE BEET AREAS IN 1940.

It is possible to construct a full table of the estimates of the beet areas to be cultivated this year in Europe from the information received by the Institute from Governments and sugar organizations. Of the non-European countries, only Japan and Turkey have communicated estimates. For Germany, Bohemia, Moravia, Slovakia and Spain the estimates of Mr. I. O. Licht have been taken.

Acreeage of Sugar-beet

COUNTRIES	191 *	1937	Average 1934 to 1938	% 1940	
				1939 = 100	Average — 100
Germany	(1) 2 000 000	1 402 331	1 110 570	—	—
Bohemia-Moravia	(1) 351 000	(1) 280 890	362 766	126	110
Slovakia	(1) 50 000	(1) 36 300		—	—
Belgium	133 500	134 168	117 364	99	114
Bulgaria	40 000	28 786	17 713	137	223
Denmark	109 000	94 600	100 282	115	108
Spain	(1) 120 000	(1) 120 000	212 299	100	98
Finland	8 150	14 460	8 664	96	94
France	670 000	621 015	585 856	107	114
Hungary	131 000	129 780	97 420	101	—
Ireland	65 000	41 660	35 429	136	117
Italy	408 000	368 313	256 870	111	139
Latvia	62 000	33 660	34 101	184	181
Lithuania	32 000	21 830	17 569	147	183
Netherlands	128 000	112 934	104 411	114	125
Poland	—	406 500	320 886	—	—
Romania	137 800	131 872	89 120	105	125
United Kingdom	350 000	344 400	354 970	100	97
Sweden	136 000	125 413	127 817	108	106
Switzerland	8 400	8 900	4 964	94	169
Yugoslavia	150 000	114 000	58 691	130	253
Total Europe (a)	5 089 850	4 571 872	4 037 762	111	125
U. S. S. R.	2 940 000	2 928 000	2 958 142	100	99
Total Europe (b)	8 029 850	7 499 872	6 995 904	111	114
Canada	—	38 600	47 314	—	—
United States	—	917 000	798 058	—	—
Total North America	—	975 600	845 572	—	—
Japan	46 500	48 446	42 481	96	109
Manchukuo	—	54 000	38 885	—	—
Turkey	91 000	91 000	63 213	100	145
Total Asia	—	193 446	144 579	—	—
TOTALS (a)	—	5,740,918	5,027,913	—	—
TOTALS (b)	—	8 668,918	7,986,055	—	—

* Approximate data — (a) Not including U. S. S. R. (b) Including U. S. S. R. (1) Licht's estimate — (2) Average of two years

The table shows that, of all European countries, with the exception of Finland and Switzerland, which are not important beet producers, none intends to reduce its beet area this year. Belgium, Spain, Hungary, the United Kingdom and the U. S. S. R. will cultivate about the same areas as last year, but all the other countries will have larger plantings. Of the more important beet-growing countries, there will be increases of 5 to 15 per cent. in Romania, France, Sweden, Italy, the Netherlands and Denmark. Licht also reports noticeable increases in Germany, Bohemia-Moravia and Slovakia. For the whole of Europe, including the Soviet Union, the beet area, according to the first estimates, will be 7 per cent. larger than last year and 14 per cent. above the average of the previous five years. In these estimates no allowance has naturally been made for the changes which may result from war operations.

CURRENT INFORMATION ON SUGAR.

Bulgaria: In order to free the country of the necessity to import sugar, the Bulgarian Government decided to encourage sugar-beet cultivation, by increasing the purchase price fixed by the Government.

Hungary: The wet weather was favourable for the growth of sugar-beet. In the north and eastern districts of the Alföld (the great Hungarian Plain) seeding was still in progress on May 8

Romania: The production of raw sugar from September 1 1939 to March 31, 1940 was 3,207,700 (160,400), against 3,426,000 (171,300) in the same period of last season, a decrease of 6.4 per cent.

U S S R: Owing to the late spring and the variable weather, the sowing of sugar-beet was much retarded. On May 1, the area sown in Kolkhozi, which contain about 95 per cent of the total sugar-beet area, total only 923,000 acres, or 33 per cent of the Plan, against 2,572,000, or 93 per cent. of the Plan, sown to the same date last year. In Ukraina, which with Crimea is the principal sugar-beet producing region of the Union, the area sown up to May 1 amounted to 746,500 acres, or 31 per cent of the Plan, while last year at the corresponding date 92 per cent. of area forecast by the Plan had been sown.

In the last ten days of April the weather in the southwest was rather warm following the cold weather of the preceding decade.

Argentina The excessive rains of March damaged cane plantations in Tucumán, where a small production of cane than last year was forecast. The situation in the other producing centres is very good.

Lavuan The growth of sugar-cane at the end of April was normal.

Netherland Indies Java and Madura. — The weather in the first half of April was variable but wet in most areas with flooding in some districts. The percentage of cane laid had increased. Flowering had taken place everywhere. According to the first analyses of the cane a good yield is forecast. Flowering had begun and on some lands the first plantings had been carried out. In the second half of

Production of Cane-Sugar.

COUNTRIES	1939-40 (1)	1938-39	Average of 1933-34 to 1937-38	1939-40 (1)	1938-39	Average of 1933-34 to 1937-38	% 1939-40	
							1938 39	Average
	ooo centsals			short tons			= 100	= 100
AMERICA.								
Antigua	304	493	514	15,200	24,640	25,688	62	59
Argentina	11,288	10,141	8,147	564,000	510,000	407,341	111	139
Barbados	2,361	3,502	2,517	118,040	175,114	125,850	67	94
Brazil	26,896	25,353	23,161	1,340,000	1,270,000	1,158,050	106	116
Cuba	62,567	61,730	57,752	3,128,000	3,100,000	2,887,585	101	108
Ecuador	540	489	413	27,000	24,500	20,657	110	131
United States (La. & Fl.)	10,140	11,660	7,196	507,000	583,000	359,800	87	141
British Guiana	4,299	4,189	3,978	215,000	210,000	198,899	103	108
Jamaica	2,538	2,642	2,086	126,900	132,100	104,287	97	122
Martinique	1,323	1,433	1,104	70,000	72,000	55,206	92	120
Mexico	6,834	7,772	6,037	340,000	388,602	301,854	88	113
Peru	8,686	8,157	8,702	434,000	410,000	435,102	106	100
Puerto Rico	22,046	17,042	18,515	1,000,000	852,000	925,750	129	119
Dominican Republic	9,921	9,502	9,030	500,000	475,000	451,494	104	110
St. Kitts	584	836	659	29,200	41,816	32,944	70	89
St. Lucia	220	180	168	11,000	9,016	8,424	122	130
Trinidad	2,866	2,877	2,983	140,000	143,870	149,129	100	96
Venezuela	551	540	489	28,000	27,000	24,472	102	113
Total America	73,964	168,538	153,451	8,593,340	8,448,658	7,672,515	103	113
ASIA.								
Taiwan	28,660	32,915	19,895	1,430,000	1,646,000	994,719	87	144
India	61,112	55,213	59,190	3,056,000	2,760,600	2,959,455	111	103
Japan	3,386	3,596	2,359	169,300	179,800	117,951	94	144
Java	34,613	34,392	19,839	1,730,000	1,720,000	991,927	101	174
Philippines	24,912	22,708	23,455	1,230,000	1,140,000	1,172,739	110	106
Total Asia	152,683	148,824	124,738	7,635,300	7,446,400	6,236,791	103	122
AFRICA.								
Egypt	3,524	3,573	3,179	176,200	178,634	158,951	99	111
Mauritius	5,059	7,084	5,886	252,930	354,180	294,310	71	86
Reunion	1,764	1,764	1,745	90,000	90,000	87,267	100	101
Union of South Africa	11,464	11,616	9,426	570,000	580,800	471,280	99	122
Total Africa	21,811	24,037	20,236	1,089,130	1,203,614	1,011,808	91	108
OCEANIA								
Australia	19,842	18,409	15,933	1,000,000	920,000	796,647	108	125
Hawaii	19,070	19,930	18,961	953,000	996,000	948,051	96	101
Fiji Islands	2,822	2,822	2,912	141,000	141,000	145,602	100	97
Total Oceania	41,734	41,161	37,806	2,094,000	2,057,000	1,890,300	101	110
TOTALS	390,192	382,560	336,231	19,411,770	19,155,672	16,811,414	102	116

(1) Approximate data.

April the eastern monsoon winds had begun to blow, accompanied by fairly moderate rains. The sugar content is increasing steadily (*Aneta*).

Egypt: Planting of the sugar cane crop remaining areas. Watering, hoeing and manuring are also in progress. Growth satisfactory.

Cutting of the few areas left from the old crop is over in Upper Egypt

CURRENT INFORMATION ON VINES.

Hungary: The budding of vines which began at the middle of April, slowed down at the beginning of May as a result of cold weather. Growth is generally reported to be two to three weeks late.

Romania: The administration is continuing its intensive propaganda for the destruction and substitution of direct hybrid producers.

Yugoslavia: The cold wet spring seriously damaged vines. It is forecast that the production of grapes this year will be poor and lower than last year.

Argentina: The frosts of the last half of March have damaged the vineyards of San Juan, Mendoza and Río Negro. The yields obtained in the Cuyo district were below those forecast. In Salta, Catamarca and La Rioja results are satisfactory but rather mediocre in Jujuy.

CURRENT INFORMATION ON OLIVES.

Argentina: The condition of olive trees in April in the provinces of Mendoza San Juan and Corrientes was good. The picking of olives in groves was in progress in La Rioja and Catamarca with generally satisfactory yields

CURRENT INFORMATION ON FLAX.

U. S. S. R.: On May 1 the area sown to flax for fibre (Dolgunets variety) on the kolkhozi, which represent practically the entire area under this crop, amounted to 628,000 acres, or 14 per cent of the Plan, against 1,271,000 or 28 per cent. of the Plan, at the same date last year. In Ukraina alone, the plan for sowings had been nearly half completed (47 per cent.) on May 1, whereas of the principal producing centres of flax for fibre, 29 per cent. of the Plan had been completed in the Smolensk area, 28 per cent. in White Russia and 12 per cent in the Kalinin area. The lateness of sowing was due principally to the late spring and to the variable weather which hampered field operations.

Argentina: The production of linseed in 1939-40, according to the third estimate issued on May 21 by the Argentine Government, is 22,078,000 centals (39,425,000 bushels) compared with 31,085,000 centals (55,510,000 bushels) last year and a five-year average of 38,106,000 centals (68,047,000 bushels); percentages, 71.0 and 57.9. The sown area this year was 15 per cent. larger than last year's and 2.2 per cent. above the five-year average. As in the case of wheat, the poor yields of this year were due to unfavourable weather.

Canada: According to the official estimate of farmers' intentions to plant on May 1, the area under flax for seed in 1940 will be 350,000 acres against a harvested area of 307,100 acres in 1939 and an average in 1934 to 1938 of 292,500; percentages, 114.0 and 119.7.

India (Telegram of 29 May) According to the final estimate area cultivated to linseed this year was about 3,713,000 acres against 3,869,000 in 1938-39 and 3,542,000 on the average of the five years ending 1937-38 percentages 96.0 and 104.8. The corresponding production is estimated at about 10,461,000 centals (18,680,000 short tons) against 9,900,800 (17,680,000) and 9,296,000 (16,600,000); percentages 105.7 and 112.5.

CURRENT INFORMATION ON COTTON.

Bulgaria. According to unofficial reports, a further extension is forecast in the acreage under cotton, which during the present year will probably reach 140,000 acres.

U. S. S. R.: The area sown to cotton on May 1 in the kolkhozi amounted to 4,013,000 acres, or 81 per cent. of the Plan, against 4,467,000, or 91 per cent. of the Plan, sown to the same date last year. In Central Asia (Turkmenistan, Uzbekistan, Tadjikistan and Kirghiztan) the area sown on April 30 this year was 2,734,000 acres, or 93 per cent. of the Plan; in North Caucasus, 414,000 acres, or 79 per cent. of the Plan, in Transcaucasus, 356,000 acres, or 73 per cent. of the Plan, in Ukraina and Crimea, 278,000 acres, or 41 per cent.; in Kazakstan, 229,000, or 92 per cent.

These figures show that according to the Plan the area to be cultivated to cotton this year should be about 5,000,000 acres, which would only slightly exceed last year's Plan.

It should be noted that in 1938 the area under cotton in kolkhozi represented about 95 per cent. of the total cotton area.

In Central Asia the weather during the third decade of April was rather warm and was favourable for cotton growth, which in most parts was about to sprout or had already sprouted during the second decade of April

United States (Telegram of May 16): There were rapid fluctuations in temperature and showers during the past week. Cotton planting is progressing favourably except locally.

Egypt: Sowing was completed in the first half of April in South Delta, and in North Delta by the end of the month. It was carried out in all parts at the normal period or even early in some parts of Upper Egypt. The constantly favourable weather conditions, particular in the latter half of the month, stimulated germination and growth. Resowing was more limited than usual. Hoeing, weeding and manuring of early and main crops and the resowing of late crops are in progress. Germination and growth are satisfactory.

British West Indies: Area and production of cotton (season August 1-July 31) are estimated as follows:—

	1939-40	1938-39	Average 1933-34 to 1937-38	% 1938-39 — 100	1939-40 Average — 100
<i>Area (in acres)</i>					
<i>Sea-Island variety.</i>					
Antigua	2,000	2,000	685	100.0	292.1
Barbados	120	56	192	213.0	62.8
British Virgin Islands	200	220	(1) 67	91.0	300.0
Montserrat	3,541	4,453	3,731	79.5	94.9
St. Kitts-Nevis	5,000	4,550	2,983	100.9	167.6
St. Vincent	5,000	5,385	3,282	92.8	152.3
<i>Total . . .</i>	<i>15,861</i>	<i>16,664</i>	<i>10,940</i>	<i>95.2</i>	<i>145.0</i>
<i>Marie Galante variety:</i>					
Grenada	5,250	5,250	5,000	100.0	105.0
St. Vincent	700	685	711	102.2	98.3
<i>Total . . .</i>	<i>5,950</i>	<i>5,935</i>	<i>5,711</i>	<i>100.2</i>	<i>104.2</i>

(1) Average of three seasons.

	1939 40	1938 39	Average 1933 34 to 1937-38	% 1939-40 1938-39 = 100	% 1939-40 Average = 100
<i>Production (in bales of 478 lb.).</i>					
<i>Sea-Island variety:</i>					
Antigua	690	518	181	133.3	381.9
Barbados	21	5	27	375.0	77.0
British Virgin Islands	31	25	(1) 15	125.9	206.1
Montserrat	1,345	1,133	1,461	118.8	92.1
St Kitts-Nevis	1,527	1,066	862	143.2	177.2
St Vincent	1,360	1,139	744	119.4	182.7
<i>Total . . .</i>	<i>4,974</i>	<i>3,886</i>	<i>3,290</i>	<i>128.0</i>	<i>151.2</i>
<i>Marie Galante variety:</i>					
Grenada	471	498	572	94.5	82.4
St. Vincent	126	119	117	105.0	107.5
<i>Total . . .</i>	<i>597</i>	<i>617</i>	<i>689</i>	<i>96.6</i>	<i>86.7</i>

(1) Average of three seasons

Montserrat. According to the latest estimate, the area cultivated to cotton for the 1940-41 season is about 4,000 acres against 3,541 in 1939-40 and 4,185 on the average of the five years ending 1938-39, percentages 113.0 and 95.6. The corresponding production of ginned cotton is forecast at about 6,000 bales (1,255 bales of 478 lb) against 6,430 (1,345) and 7,113 (1,488); percentages 93.3 and 84.4.

CURRENT INFORMATION ON HEMP.

U S S R. On May 1 the area sown in kolkhozi was 186,000 acres, or 14 per cent of the Plan, against 313,000 or 24 per cent. sown at the same date last year.

Argentina Hemp harvesting was completed in April with better yields than last year.

CURRENT INFORMATION ON TOBACCO.

U S S R. Owing to variable weather tobacco sowing was much retarded. In kolkhozi in which about nine-tenths of the tobacco area is cultivated in the Union, 4,400 acres of yellow-leaf tobacco, or 2 per cent. of the Plan, had been sown on May 1, against 11,600, or 7 per cent, at the same date last year. For the «Makhorka» variety the corresponding figures are as follows 24,600 acres, or 11. per cent, and 45,500, or 21 per cent.

Argentina. Tobacco picking in April was in full swing; yields were high and the leaf was of good quality.

Union of South Africa: Excessive rain in March hampered tobacco harvesting and adversely affected tobacco being cured in the Oudtshoorn district of Cape Province. Very good tobacco crops are expected in Transvaal where is a steady annual increase in the area sown.

CURRENT INFORMATION ON OTHER PRODUCTS:

Cacao.

Gold Coast and Togoland under British Mandate: MAIN CROP 1939-40 — SITUATION IN FEBRUARY. — The weather was drier than usual in February, especially in the Eastern Province and in Trans-Volta. Elsewhere a few showers stimulated flowering. Marketing of the main crop was very rapidly drawing to a close and it was expected to be considerably below expectations. Quality continued to show slight deterioration and mould was appearing amongst the prominent defects.

By the end of February it was estimated that 100 per cent. of the crop was ripe, of which all but a fraction had been harvested, and very little remained in farmers' hands. From returns submitted in connection with the Cacao Control it was estimated that about 501.8 million lb. had already been accounted for. From data arrived at independently of the Cacao Control returns a similar figure was obtained, as shown below:

Exports October 1, 1939 to February 29, 1940 . . .	207.6 million lb.
Stocks at the end of February 1940	328.6 " "
	536.2 million lb.
Less carry over of 1938-39 crop	33.6 " "
1939-40 main crop accounted for	502.6 million lb.

It has gradually been becoming evident that the main crop estimate previously given was too high but it would appear from the above figure for crop already accounted for that the drop is likely to be much larger than was expected.

At a meeting held in Accra on March 11 it was the opinion of the Cocoa Crop Estimates Committee that the main crop 1939-40, which had previously been estimated at 250,000 long tons (560 million lb.) was not likely to exceed 235,000 long tons (526 million lb.).

SITUATION BY THE MIDDLE OF MARCH. — Reports from many districts stated that practically all cacao had been marketed and there were only a few areas where small quantities were still in farmers' hands. Quality continued to show a decline. Flowering had been fairly profuse in Ashanti and generally the trees were reported to be in good condition after the long dry season.

Exports during the first half of March, exclusive of cacao passing over the Eastern Frontier, amounted to 17.2 million lb. (customs figure) as compared to approximately 45 million lb. for the same period last year. From district reports it was estimated that 98.6 per cent. of the crop had already been marketed, leaving only 1.4 per cent. in farmers' hands. It was thought to be probable that a certain amount of the main crop would remain unsold owing to the prohibition of the export of sub-grade cacao.

MOVEMENT — Movements statistics for February are as follows,

	February 1940	February 1939 (million lb.)
Railway off-loadings, Takoradi	14 1	33 9
<i>Exports —</i>		
Takoradi	10.8	43 6
Accra	13 9	46.7
Other ports	2 8	27 8
<i>All ports</i>	<i>27 5</i>	<i>118 1</i>
Eastern Frontier	1.4	4.0
<i>Total exports</i>	<i>28 9</i>	<i>122 1</i>

Tea.

Japan Despite favourable weather the crop condition of tea at the beginning of May was not very satisfactory.

The production of tea in 1939 is estimated at 126,700,000 lb. against 120,631,000 lb. in 1938 and an average of 103,696,000 lb. in 1933 to 1937, percentages, 105 0 and 122 2.

WORLD STATISTICAL SITUATION OF COFFEE

World Production.

The statistics furnished by the monthly enquiry, which the Institute has for some years been conducting in close cooperation with the coffee-producing countries, are, in spite of the exceptional conditions of the present moment, more numerous and fuller than usual and from them not only can the principal characteristics of the 1939-40 coffee season be elucidated, but the volume of production of coffee during this season can be determined with fair accuracy.

In Brazil, where the production of coffee is of paramount importance, the general conditions accompanying flowering, ripening, picking and particularly drying, were on the whole unfavourable during the current season. In the State of São Paulo, which produces more than two-thirds of the total crop of the country, excessive rain, frost and "stephanadores" infestation caused very serious damage, which, according to reliable reports, appeared to have reduced the yield by about 30 per cent, and to have affected to a very great extent the quality of the product. In this State also, many old plantations were abandoned. In the other producing states the returns were also down as a result of the same unfavourable factors, though to a smaller extent. The exportable crop of coffee from the 1939-40 season was calculated by the "Departamento Nacional do Café" as 2,892 million lb. of which 2,091 million lb. came from the State of São Paulo. The remaining 801 million lb. were produced respectively in Minas Geraes (411 million lb.), Espirito Santo (125 million lb.), Rio de Janeiro (71 million lb.),

Paraná (114 million lb.), Bahia (40 million lb.), Pernambuco (27 million lb.) and Goyaz (13 million lb.). To this quantity obtained from the 1939-40 crop were added for the current commercial year the stocks remaining over from the 1938-39 season which amounted to 93 million lb. Thus the total supplies for the current commercial season amount to 2,985 million lb., against 3,131 million lb. in 1938-39 and 3,368 million lb. in 1937-38. Nevertheless, this estimate reflects only in part the effects of the unfavourable factors mentioned above, for it was prepared without making allowance for damage suffered during drying operations owing to the abnormal rainfall in São Paulo. After allowing for this factor and the exceptional reduction which has up till now taken place in movements of coffee from the interior of the State of São Paulo to Santos, the port of shipment, and in default of an official estimate from the Ministry of Agriculture of this country and a revision of the figure for the exportable crop, we have estimated Brazilian production in 1939-40 at 2,756 million lb. This crop shows an exceptional deficit, being 5.7 per cent. below the poor crop of 1938-39 and 17 per cent. below the preceding five-year average (3,303 million lb.).

In Colombia weather conditions were on the whole favourable for plantations and in general better than in the previous season. Rainfall in the principal coffee centres was normal and well distributed for seasonal planting requirements. Flowering was particularly ample in the Department of Cundinamarca and picking, drying and preparation of the beans proceeded normally. The output of this country in 1939-40, estimated at 589 million lb. is not far short of the record figure for 1937-38, and exceeds slightly the previous season's harvest and is 9.3 per cent. larger than the average for the preceding five years (539 million lb.). The good results obtained during the current season confirm the tendency towards a gradual increase in production, which has continued for a number of years in this country.

In Venezuela the 1939-40 coffee season was characterized by generally favourable conditions for cultivation, although the latest reports suggest that the good yields expected at the beginning of the season were reduced by about 16 per cent. owing to insufficient rainfall in several of the coffee areas. As a result of this reduction, the first estimate of production of 159 million lb. made some months ago by the " Instituto Nacional del Café " of Venezuela has now been reduced to 143 million lb., a figure which is distinctly in excess (66.7 per cent.) of the short crop for the previous season and 8.3 per cent. above the average annual production for the preceding five years (132 million lb.). This crop, which was obtained from a productive area of 741,000 acres, leaves an exportable surplus for the current commercial season of 117 million lb. of good quality coffee.

In Ecuador the output of coffee in 1939-40 was officially estimated at 37 million lb., a normal crop, which was obtained from a producing area of 86,000 acres. The exportable surplus for the current season is estimated at 29 million lb. This figure coincides exactly with actual exports in the previous season. The coffee harvests of other South American countries of less importance such as Peru, Bolivia, Netherlands Guiana and Trinidad and Tobago were also slightly above normal.

World Production of

CONTINENTS	1939-40		1938-39		Average 1933-34 to 1937-38	
	Absolute data	Pro-portion of world pro-duction	Absolute data	Pro-portion of world pro-duction	Absolute data	Pro-portion of world pro-duction
	(000 lb.)	%	(000 lb.)	%	(000 lb.)	%
World production	4,841,367	100.0	4,931,757	100.0	5,274,357	100.0
America :						
Central and North.	634,933	13.1	634,933	12.9	641,106	12.1
South	(1) 3,551,658	73.4	3,657,481	74.1	4,045,937	76.7
Total . . .	4,186,591	86.5	4,292,414	87.0	4,687,043	88.8
Asia	(1) 293,216	6.0	291,011	5.9	313,499	6.0
Africa	348,332	7.2	335,104	6.8	260,587	4.9
Oceania	13,228	0.3	13,228	0.3	13,228	0.3

(1) Estimated production.

The total output of South America in 1939-40 can therefore be estimated at 3,552 million lb, against 3,657 million lb. in 1938-39 and 4,046 million lb. for the preceding five-year average. The share of all the producing countries of South America in world production was 73.4 per cent. in 1939-40, against 74.1 per cent. in the previous season and 76.7 per cent. for the average of the five preceding years.

In Central and North America the weather conditions attending cultivation in the 1939-40 season varied greatly from one country to another but were on the whole favourable.

In Salvador rainfall was very irregular, and this caused very serious damage to plantations, especially in the most important coffee areas of the country. The continuation of the rain into the drying period led to excessive fermentation of the beans so that the final product was mediocre in quality. The output in this country in 1939-40, estimated at 119 million lb., was the smallest for many years, and was 18.2 per cent. below that of the past season (146 million lb.) and 10.4 per cent. below the average for the preceding five years (133 million lb.).

In Guatemala the flowering of the coffee plants was normal while the weather was on the whole favourable for the development of the berries, except in the district of the Verapaz, where excessive rains caused damage to plantations. The output in this country during 1939-40 was fairly plentiful, slightly exceeding that

Coffee by Continents.

1937-38		1936-37		1935-36		1934-35		1933-34		Average 1928-29 to 1932-33	
Absolute data	Proportion of world production	Absolute data	Proportion of world production	Absolute data	Proportion of world production	Absolute data	Proportion of world production	Absolute data	Proportion of world production	Absolute data	Proportion of world production
(ooo lb.)	%	(ooo lb.)	%	(ooo lb.)	%	(ooo lb.)	%	(ooo lb.)	%	(ooo lb.)	%
5,041,989	100.0	5,632,830	100.0	4,550,337	100.0	5,463,074	100.0	5,683,536	100.0	5,130,174	100.0
637,138	12.6	725,323	12.9	683,435	15.0	588,636	10.8	570,999	10.0	590,841	11.5
3,765,508	74.7	4,279,187	76.0	3,267,262	71.8	4,316,666	79.0	4,601,063	81.0	4,063,133	79.2
440,266	8.7	5,004,510	88.9	3,950,697	86.8	4,905,302	89.8	5,172,062	91.0	4,653,974	90.7
346,127	6.9	328,490	5.8	306,444	6.7	299,830	5.5	286,602	5.1	302,034	5.9
279,988	5.5	286,602	5.1	279,988	6.2	244,714	4.5	211,644	3.7	163,143	3.2
13,228	0.3	13,228	0.2	13,228	0.3	13,228	0.2	13,228	0.2	11,023	0.2

of the previous season and being 7 million lb. above the average for the five years ending 1937-38.

In the case of Mexico, the information at our disposal suggests that the efforts of the Government to extend the cultivation of coffee in this country have had satisfactory results. Production in the current season reached the record figure of 110 million lb., against 86 million lb. in 1938-39 and an average of 95 million lb.

For the Republic of Haiti, the estimate for the exportable crop of coffee during the present commercial season ending September 30, 1940, indicates a decline of 9 million lb. in relation to the actual exports of the previous season and of 6 million lb. in relation to the average. The poor crop this year is mainly due to the unfavourable weather conditions during the latter part of the season, and particularly to the drought which affected the ripening of the berries and to the abnormal rainfall during drying operations. The Government of Haiti has prepared a large-scale plan to be put into effect in the next few years for an expansion of cultivation in the most suitable parts of the country and for the improvement of the quality of the product.

Cuban production, estimate at 71 million lb., slightly exceeds that of 1938-39 and is not far short of the average.

Yields in the Dominican Republic have not reached the level that was expected from the generally satisfactory flowering, and production in the current season, estimated at 46 million lb., is not only below the average for the five

Production of Coffee in the principal producing Countries.

(ooo pounds).

COUNTRIES	1939-40	1938-39	Average 1933-34/ 1937-38	1937-38	1936-37	1935-36	1934-35	1933-34	Average 1928-29/ 1932-33
I. — American Countries.									
Brazil	*2,755,787	2,923,339	3,302,977	2,974,046	3,476,702	2,504,239	3,643,151	3,916,746	3,403,508
Colombia	588,636	584,227	538,591	589,959	576,731	555,126	463,193	507,948	445,115
Salvador	119,050	145,506	132,939	112,877	166,009	127,869	130,073	127,869	138,010
Venezuela	143,301	85,981	132,322	132,278	157,852	140,214	125,223	106,043	132,719
Guatemala	121,255	119,050	113,671	125,664	147,710	121,255	94,358	79,367	101,413
Mexico	110,231	85,981	94,975	91,051	103,177	107,145	92,374	81,130	86,201
Haiti (1)	55,116	64,596	61,289	55,336	54,675	79,587	41,888	74,957	67,903
Cuba	70,548	67,682	72,092	72,312	69,005	82,233	69,887	67,021	61,068
Dominican Republic	46,297	47,400	51,588	61,509	58,423	53,793	40,786	43,431	35,054
Costa Rica (1)	52,911	44,534	51,192	55,116	58,423	46,959	53,352	42,108	49,604
Nicaragua (1)	26,456	27,337	33,995	33,069	34,833	28,881	40,786	32,408	29,101
Puerto Rico	* 19,842	18,960	14,815	16,535	20,503	20,062	7,937	9,039	9,921
<i>Total of American countries</i>	<i>4,109,430</i>	<i>4,214,593</i>	<i>4,600,446</i>	<i>4,319,752</i>	<i>4,924,043</i>	<i>3,867,363</i>	<i>4,803,008</i>	<i>5,088,066</i>	<i>4,559,617</i>
II. — Non-American Countries.									
Netherlands Indies:									
European plantations	125,884	100,531	127,472	137,569	111,113	121,916	141,758	125,003	115,743
Native plantations (1)	* 110,231	136,026	131,484	153,442	164,245	122,577	107,586	109,570	135,805
India	* 33,069	35,274	36,024	37,479	33,951	41,227	32,849	34,613	33,290
Italian East Africa (Ethiopia) (2)	* 33,069	* 33,069	37,876	28,660	31,967	43,652	49,384	35,715	43,652
Tanganyika (1)	37,920	30,644	32,144	30,424	27,117	41,668	33,069	28,440	23,149
Kenya	36,376	39,683	38,272	36,817	44,974	48,722	30,865	29,983	25,574
Angola	41,888	38,801	36,332	31,526	33,069	35,274	40,345	41,447	24,251
Madagascar	66,139	65,037	44,754	47,400	61,730	46,297	33,069	35,274	24,692
Belgian Congo	50,706	47,840	33,202	43,211	39,904	31,526	29,322	22,046	11,464
<i>Total of Non-American countries</i>	<i>535,282</i>	<i>526,905</i>	<i>517,560</i>	<i>546,528</i>	<i>548,070</i>	<i>532,859</i>	<i>498,247</i>	<i>462,091</i>	<i>437,620</i>
Grand total	4,644,712	4,741,498	5,118,006	4,866,280	5,472,113	4,400,222	5,301,255	5,550,157	4,997,237

* Unofficial estimate. — (1) Exports. — (2) Export figures compiled from the statistics of French Somaliland and Anglo-Egyptian Sudan till 1937-38.

years ending 1937-38 but also slightly below the rather unsatisfactory crop of 1938-39. The exportable crop expected in Costa Rica for 1939-40 is fairly plentiful, exceeding actual exports in the preceding season by about 20 per cent. and the average by a small margin. The good results this year were due to the regular rainfall and the very favourable weather conditions which obtained in the main coffee-producing centres of the country.

In Nicaragua the dry conditions which predominated in 1939 seriously affected flowering and ripening of the shrubs. The exportable crop for the current commercial season, officially estimated at 26 million lb., is the lowest for many years.

The information available as to the results of the gathering in Puerto Rico suggests a satisfactory crop for this country, similar to that of the preceding season. Finally, the yields obtained in the other, less important, countries of Central America, such as Jamaica, Honduras and Panama were for the most part normal.

In sum, production in Central and North America, estimated at 635 million lb., is just equal to the figure for the 1938-39 season, and very close to the average quantity for the five preceding years (641 million lb.).

The total output of coffee for the whole American continent in 1939-40 reached 4,187 million lb., amounting to 86.5 per cent. of the world output, against 4,292 million lb. in 1938-39 (87.0 per cent.) and 4,687 for the five preceding years (88.8 per cent.).

The total output for the continent of Asia, estimated at 293 million lb. is practically the same as the rather short crop of the previous season, lying 6.5 per cent. below the average for the five preceding years.

The output of the Netherlands Indies, which normally supply 4/5 of the total production of the continent, is estimated at 236 million lb., of which 126 million lb. were produced on plantations owned by Europeans and 110 on native plantations. Output in the previous season amounted to almost the same figure, but of this European plantations supplied barely 101 million lb., against 136 million lb. from native plantations. The figures for the average production during the five preceding years were 127 million lb. and 131 million lb. for European and native plantations respectively, totaling, therefore, 258 million lb.

In India the ripening of the berries was delayed and crop expectations suggest an output slightly lower than the average.

Information available about the Philippines and Indochina indicates that the crops are slightly above those of the preceding season, which were themselves good. In Timor and Kambing floods caused rather serious damage to the plantations.

Taken as a whole, the continent of Asia in 1939-40 supplied 6 per cent. of the world production - an average proportion.

The output of coffee in Africa during 1939-40, estimated at 348 million lb., marks a new record, exceeding the former maximum of the preceding season by 13 million lb. and the average of the five years ending 1937-38 by 88 million lb. This continent now takes second place, coming, though at a great distance, next to the American continent, and displacing Asia, where production has for several years been fairly stable. Africa's share in the world total, though not large, has increased steadily, having risen from an average of 3.2 per cent. during the years 1928-29 to 1932-33 to 7.2 per cent. in 1939-40. During this period production has more than doubled. The relatively important place gained by this continent in recent years is the result of expansion in those colonial and mandated territories which enjoy preferential tariff rates. It may be expected that the output of this continent will increase when the newly-planted areas begin to give yields. Examining the separate figures for the different countries of this continent, it will be noted that production in Madagascar, which is the largest producer in Africa, reached the exceptionally high figure of 66 million lb., which is slightly in excess of the record of the preceding years.

Next in importance comes the Belgian Congo, where 51 million lb. were obtained in 1939-40 from 143,000 acres, against 48 million lb. in the previous year. Forecasts for Angola (42 million lb.) represent a record for this country.

Information on the crops and exportable supplies of British East Africa points to a crop below average in Kenya but a rather more plentiful one in Uganda and Tanganyika.

No figures are available for the crops of the last two years in Italian East Africa, but it is known that the Government has for some time been following a policy of development, especially in the Harrar territory, the main coffee area.

Prospects on the Ivory Coast, in French Equatorial Africa and in the French Cameroons are rather favourable and on the whole better than average.

Total world coffee production in 1939-40 may be put at about 4,800 million lb., against 4,930 million lb. in 1938-39 and an average of 5,270 million lb. in the preceding five years.

International trade.

The statistics so far available on international trade in coffee during the present commercial season refer, in the case of the major exporting countries, to the period from July 1, 1939 to March 31, 1940, while in the case of several European countries statistics cover at the most the imports of the quarter July to September 1939. To fill in the gap for these latter countries and to give as precise and complete a review as possible of international trade in coffee during the calendar year 1939, which comprises the first half of the present commercial season (July 1-December 31, 1939), we have adopted the statistics of the major exporting countries according to the countries of destination.

Exports of the main exporting countries. — Brazilian coffee exports during the commercial season 1938-39 (July 1, 1938 — June 30, 1939) were determined largely by the new commercial policy adopted by this country since November 1937, which was aimed, among other things, at the abandonment of the "valorization" of coffee and at free competition on the world market. A price war was the corollary of this new policy of Brazil. The results obtained were very satisfactory in relation to the desired objective of checking the regressive tendency, which had continued for several years, in Brazilian exports and in furthering their expansion throughout the world. Exports during the 1938-39 commercial season reached an exceptionally high figure (2,156 million lb.) which is 223 million more than the exports of last season and inferior only to the record figure of 1930-31 (2,318 million lb.). On examination it is found that the exceptional volume of size the 1930-31 exports was due to the barter of coffee with wheat exchanged with the United States. The increase in Brazilian exports continued during the first nine months of the present commercial season (July 1, 1939-March 31, 1940), despite difficulties of all kinds due to the war. The total of the first half year (July 1-December 31, 1939) was 1,141 million lb. This figure is 28 million lb. above the corresponding exports of last season, which were nearly as large as the record of the same period of 1935-36. It should be noted in particular that the highest level of exports, not only of this half year but of the whole year, was registered during the first quarter of the war (September

Brazil: Production and Exports of Coffee by commercial season.

(ooo pounds).

Season (1 July-30 June)	Production	Exports			Percentage of production %
		First half-year	Second half-year	TOTAL	
1929-30	3,475,820	1,021,846	972,903	1,994,749	57.4
1930-31	3,602,586	1,049,404	1,268,544	2,317,948	64.3
1931-32	2,869,767	1,092,615	928,149	2,020,764	70.4
1932-33	3,385,650	650,586	956,368	1,606,954	47.5
1933-34	3,916,746	1,088,426	1,008,839	2,097,265	53.5
<i>Average 1929-30 to 1933-34</i>	<i>3,450,114</i>	<i>980,575</i>	<i>1,026,961</i>	<i>2,007,536</i>	<i>58.2</i>
1934-35	3,643,151	862,451	911,174	1,773,625	48.7
1935-36	2,504,239	1,116,425	943,361	2,059,786	82.3
1936-37	3,476,702	932,999	820,784	1,753,783	50.4
1937-38	2,974,046	782,864	1,150,596	1,933,460	65.0
1938-39	2,923,339	1,113,118	1,042,570	2,155,688	73.7
1939-40	(*) 2,755,787	1,140,676	(1) 470,909	..	...

(*) Unofficial estimate. (1) January-March 1940.

to November), while the largest monthly figures were 273 million lb. in October. The highest exports of the year 1938 also took place in October (212 million lb.).

The exports of the first quarter of the present year (January 1-March 31, 1940) were also maintained at the high level the corresponding period of last year. Total Brazilian exports during the first nine months of the present commercial season (July 1, 1939-March 31, 1940) thus total 1,612 million lb., against 1,587 million lb. exported during the same period of last season. As regards countries of destination, the European continent absorbed up to March 31, 1940 almost exactly the same quantity as last season, whereas exports to the United States and to other countries increased slightly. Among the favourable conditions, which contributed to maintain the high level of Brazilian exports during the period under review are, in particular, the compulsory war risk insurance by the "Departamento Nacional do Café", decreed by the Brazilian Government for all shipments broad of coffee and the existence in the world at the opening of hostilities of very low visible stocks. According to an estimate of the "New York Coffee and Sugar Exchange", visible world coffee stocks (including exportable quantities in Brazilian ports) amounted on July 1, 1914 to 1,394 million lb., against only 1,078 million lb. on August 31, 1939, distributed as follows:

Visible World Coffee Stocks.

	July 1, 1914	August 31, 1939
	(million lb.)	
United States	219	176
Europe	1,046	452
Brazilian ports	129	450
Total	1,394	1,078

The heavy reduction in total world visible stocks on August 31, 1939 compared with July 1, 1914 is centered almost entirely in the European continent. Stocks in the United States show but a slight decrease, while the exportable quantity in Brazilian ports had risen considerably. This different statistical position in the distribution of visible world coffee stocks at the beginning of the war, particularly in Europe, largely explains the animation of the market and the higher level maintained by Brazilian exports during the first nine months of the present season.

Colombian exports in the 1938-39 season (July 1, 1938-June 30 1939), like those of Brazil, were also exceptionally high (537 million lb.), approaching the record figure of 1936-37 (542 million). The principal countries of destination of Colombian coffee are the United States, which in 1938-39 absorbed about 77 per cent. of the total, and, to a much less extent Germany, with 16 per cent. The

Colombia: Production and Exports of Coffee by commercial season.

(ooo pounds)

SEASON (July 1-June 30)	Production	Exports			Percentage of production %
		First half year	Second half year	Total	
1929-30	464,295	186,732	214,070	400,802	86.3
1930-31	445,335	194,228	202,605	396,833	89.1
1931-32	447,319	196,433	202,165	398,598	89.1
1932-33	479,267	218,920	223,990	442,910	92.4
1933-34	507,948	210,101	248,241	458,342	90.2
<i>Average 1929-30 to 1933-34 . .</i>	<i>468,837</i>	<i>201,283</i>	<i>218,214</i>	<i>419,497</i>	<i>89.5</i>
1934-35	463,193	167,552	246,037	413,589	89.3
1935-36	555,126	254,855	250,887	505,742	91.1
1936-37	576,731	273,154	268,965	542,119	94.0
1937-38	589,959	251,769	279,988	531,757	90.1
1938-39	584,227	280,870	256,348	537,268	92.0
1939-40	588,636	237,439	(1) 124,341	...	...

(1) January-March 1940.

exports of the first half of the present season, (July 1-December 31, 1939) show on the contrary a fairly marked decrease (44 million lb.) compared with the corresponding figures of the 1938-39 season, owing to the abnormally low exports of the July-September quarter. The volume of trade in the October-December 1939 quarter and in the first quarter of the present year returned to a fairly high level, slightly higher than the corresponding figures of the same period of last season. The total exports of Colombia during the first nine months of the present season amounted to 362 million lb., against 397 million lb. in the same period of 1938-39.

The disposal of coffee of the other producing countries of "Milds" during the first half of the present season also shows, on the whole, a decline on the same period of 1938-39 season. The reduction was particularly large in the case of the American countries, especially Venezuela, Salvador, Guatemala and Haiti,

which are the principal exporting countries in this continent after Brazil and Colombia. On the other hand, the exports of Costa Rica, Mexico, the Dominican Republic and Peru show a slight increase on the first half of 1938-39.

In the Netherlands Indies exports from Java and Madura during the first half of the present season (34 million lb.) were about 4 million lb. above the corresponding figure of 1938-39, while the exports of the Outer Provinces, which are much more important, show a decrease of about one-third. The aggregate exports of the Netherlands Indies in the first half of 1939-40 were 16 million lb. below the already low figure of last season.

Exports from India do not show any appreciable variation, while those of Indochina have risen slightly. Finally, all the producing countries of Africa, with the exception of the Belgian Congo, exported in the first half of the present season larger quantities than those of the same period of 1938-39, marketing having been assisted by the preferential tariffs, which most countries applied to exports from their colonies. The largest increase is that of Tanganyika.

World Net Imports of Coffee. — The table of coffee imports in 1939 has many gaps in regard to Europe, for a number of countries have suspended publication of all statistical or economic information since the opening of hostilities. The European countries for which complete import figures are available for the calendar year 1939 are Belgium, Denmark, Norway, the Netherlands, Portugal, Switzerland and Yugoslavia, while for the other countries, among which appear the largest coffee importers, such as France, Germany, Italy, etc., statistics cover only to the end of July. Examining in detail the net coffee imports of the first group of countries, it may be noted that except in the case of the Netherlands, which reduced their imports by 12 million lb. compared with 1938, and Yugoslavia, which imported exactly the same amount as in 1938, all the other countries

World net Imports of Coffee.

YEARS	Europe		United States of America		Other countries		Total	
	Absolute data	Percentage of total	Absolute data	Percentage of total	Absolute data	Percentage of total	Absolute data	Percentage
	(000 lb.)	%	(000 lb.)	%	(000 lb.)	%	(000 lb.)	%
1939	(1) 1,543,241	40.0	2,005,331	52.0	(1) 308,648	8.0	3,857,220	100.0
1938	1,668,464	41.9	1,985,269	49.9	328,490	8.2	3,982,223	100.0
<i>Average 1933-1937 . . .</i>	<i>1,478,513</i>	<i>43.4</i>	<i>1,654,266</i>	<i>48.5</i>	<i>279,150</i>	<i>8.1</i>	<i>3,411,929</i>	<i>100.0</i>
1937	1,531,997	43.5	1,694,038	48.0	300,271	8.5	3,526,306	100.0
1936	1,479,527	42.1	1,735,044	49.4	296,743	8.5	3,511,314	100.0
1935	1,487,905	42.2	1,752,901	49.7	287,484	8.1	3,523,290	100.0
1934	1,444,694	45.0	1,519,211	47.3	249,344	7.7	3,213,249	100.0
1933	1,448,442	44.2	1,570,137	47.8	261,910	8.0	3,280,489	100.0
<i>Average 1928-1932 . . .</i>	<i>1,479,086</i>	<i>45.0</i>	<i>1,540,816</i>	<i>46.9</i>	<i>264,997</i>	<i>8.1</i>	<i>3,284,899</i>	<i>100.0</i>
<i>Average 1909-1913 . . .</i>	<i>1,269,646</i>	<i>54.2</i>	<i>857,601</i>	<i>36.6</i>	<i>216,054</i>	<i>9.2</i>	<i>2,343,301</i>	<i>100.0</i>

1) Calculated figure.

increased their purchases. The increase is about 10 million lb. in the case of Belgium, Denmark and Switzerland and about 4 million in the case of Norway. Compared with the average of the five years ending 1937, the aggregate and separate net exports of this group of countries show a still more marked increase.

The partial statistics available for the other European countries given in the table show, on the contrary, except in the case of Sweden, the United Kingdom and Finland, a decrease on the corresponding figures of 1938. Germany imports to the end of July show a reduction of over 37 million lb. on the corresponding figure of 1938, but it should be noted that the imports of this country, excluding Austria in 1938, attained the highest level of the post-War years. France, which in 1938 was the second largest importer in Europe, decreased its imports by 22 million lb. up to the end of July. Purchases by France to the end of December, according to commercial reports, have largely offset this reduction. Finally Italian imports during the same period remain unchanged compared with the first seven months of 1938. The aggregate European net imports may be esti-

Net imports of coffee into the principal European and extra-European countries.

(1,000 pounds).

COUNTRIES	1939	1938	Average 1933 to 1937	1937	1936	1935	1934	1933	Average 1928 to 1932
I. — Principal European countries.									
Germany	1) 205,251	435,194	335,545	391,983	342,379	325,403	332,238	285,720	318,128
Austria	2) 5,291	17,858	11,552	11,464	11,464	11,685	11,905	11,244	19,621
Belgium	119,932	108,027	104,455	108,027	114,200	107,586	104,940	87,524	102,074
Denmark	87,303	76,060	58,158	59,305	59,745	55,336	57,541	58,864	58,643
Spain	—	33,069	49,913	39,683	48,502	52,470	55,116	53,793	51,147
Finland	3) 42,549	57,761	40,874	45,636	48,281	37,920	37,479	35,054	37,920
France	1) 228,400	410,943	411,340	408,518	411,163	415,573	388,676	432,769	392,865
Italy	1) 45,856	79,367	83,203	83,776	70,107	89,067	86,642	86,421	98,988
Norway	46,738	42,549	37,479	36,376	35,495	44,313	35,495	35,715	36,376
Netherlands	88,185	100,090	80,778	80,469	68,344	71,650	75,619	107,806	81,130
Poland	9,039	13,448	14,198	12,346	13,189	13,007	14,991	16,755	16,976
Portugal	14,330	12,566	11,156	10,582	11,244	11,905	11,635	10,362	9,259
United Kingdom	3) 39,022	31,306	31,967	31,967	31,306	27,558	33,731	35,274	40,124
Sweden	4) 89,949	116,184	102,603	104,279	102,735	106,704	100,090	99,208	96,563
Switzerland	48,722	38,140	31,967	29,763	33,290	41,006	30,203	25,574	32,849
Czecho-Slovakia	—	25,794	23,766	24,251	24,912	24,692	24,471	20,503	31,085
Yugoslavia	15,873	15,873	14,374	14,551	15,212	14,551	12,787	14,771	19,621
<i>Total of countries considered . . .</i>	...	1,614,229	1,443,328	1,492,976	1,442,269	1,450,426	1,413,609	1,417,357	1,443,369
II. — Principal non-European countries.									
United States	2,005,331	1,985,269	1,654,266	1,694,038	1,735,044	1,752,901	1,519,211	1,570,137	1,540,816
Canada	1) 29,322	42,108	35,715	37,258	39,463	34,172	34,172	33,510	29,542
Argentina	55,336	61,289	48,193	50,045	49,163	49,825	40,565	51,368	50,706
Algeria	5) 16,314	34,613	31,526	32,188	34,172	31,306	29,101	30,865	27,778
Union of South Africa	38,361	37,258	29,586	30,203	31,085	31,306	26,896	28,440	27,999
Japan	3,086	9,480	9,612	17,196	12,125	7,055	6,393	5,291	4,409
<i>Total of countries considered . . .</i>	...	2,170,017	1,808,898	1,860,928	1,901,052	1,906,565	1,656,338	1,719,611	1,681,250
Total of both groups.	...	3,784,246	3,252,226	3,353,904	3,343,321	3,356,991	3,069,947	3,136,968	3,124,619

1) Seven months: January-July. — 2) Three months. — 3) Eight months. — 4) Nine months. — 5) Six months.

mated at about 1,540 million lb., which is 60 million lb. more than the net imports of the two previous half decades ending respectively in 1932 and 1937, which were about the same size (1,480 million lb.), but were about 130 million less than the record imports of 1938.

The share of Europe in world net imports in 1939 was 40 per cent., against 41.9 per cent. in 1938 and 45.0 and 43.4 per cent. respectively on the average in the half decades ending in 1932 and 1937.

United States coffee imports in 1939 amounted to 2,006 million lb. which is 20 million lb. more than the record net exports of 1938, and 350 million lb. above the average of 1933 to 1937. Compared with the average imports of the five years ending 1932 the increase is 464 million lb. The exceptionally large increase, which has continued for a number of years in the coffee imports of the United States, is due both to the exemption from duty enjoyed by coffee imported from all countries and to the large-scale publicity conducted by commercial associations, particularly the "Pan-American Coffee Bureau" of New York. The United States have thus become the largest coffee consuming market in the world, importing in 1939 52 per cent. of the world total, against 49.9 per cent. in the previous year and on averages of 48.5 and 46.9 per cent. respectively in the five-year periods ending 1937 and 1932.

Available statistics for the other extra-European importing countries show more or less general increases in 1939 on the previous year.

The partial figures for Canada and Algeria show little change compared with the corresponding figures of 1938.

Argentine imports did not reach the exceptionally high figure of 1938 but were about 7 million lb. more than the previous five-year average. The imports of the Union of South Africa, on the other hand, at 38 million lb., marked an absolute record for this country. Japan and Egypt both imported in 1939 about 7 million lb. less than in 1938. On the aggregate, world net imports in 1939 may be estimated at 3,860 million lb., a decrease of 120 million lb. on the record figure of 1938, but an increase of about 440 million lb. on the preceding five-year average.

Years	Net world imports (million lb.)	Exports from Brazil (million lb.)	Percentage of total %
<i>Average 1909-1913</i>	2,343	1,672	71.4
<i>Average 1928-1932</i>	3,285	1,937	59.0
1933	3,280	2,045	62.3
1934	3,213	1,871	58.2
1935	3,528	2,028	57.5
1936	3,511	1,876	53.4
1937	3,526	1,603	45.5
<i>Average 1933-1937</i>	3,412	1,885	55.2
1938	3,982	2,264	56.8
1939	3,857	2,183	56.6

Brazil contributed 2,183 million lb. to the world total in 1939, against 2,264 million lb. in the previous year. The share of this country, which for several years has shown a very considerable decrease, having declined respectively from 71.4, to 59.0 and 55.2 per cent. on the average during the periods 1909 to 1913, 1928 to 1932 and 1933 to 1937, reached its minimum of 45.5 per cent. in 1937. In 1939 the proportion remained at about the same level as in the previous year (56.8 per cent.).

The countries producing "Milds" supplied on the aggregate in 1939 about 1,680 million lb., against 1,720 million lb. in the previous year and 1,920 million lb. in 1937. Unlike Brazil, where the contraction in exports up to 1937 had been accompanied by the accumulation of excessively heavy stocks, the "Milds" producing countries, normally disposed of their entire annual exportable supplies.

Measures taken in the various producing and importing countries.

During the present commercial season the majority of producing-exporting countries, to resist the policy followed by Brazil since November 1937 and at the same time to modify the much more serious repercussions resulting from the war in Europe, had to continue existing or adopt new emergency measures.

In Brazil, in a congress of the coffee-producing States, held under the auspices of the D. N. C., a biennial plan was adopted for the 1939-40 and the 1940-41 seasons, including a series of measures designed to re-establish the equilibrium between exports and world demand, and at the same time to regulate arrivals of coffee in the ports. These measures may be summarized as follows:

(1) For shipments of coffee of ordinary current quality (*despachos comuns*) of the 1939-40 season there was established an equilibrium quota corresponding to 30 per cent. of the total to be purchased by the D. N. C. at the price of 2 milreis per bag of 133 lb. gr. weight. This quota must consist of coffees not inferior to Grade 8 and with a maximum of 1 per cent. of impurity.

(2) For shipments of superior quality (*despachos preferenciais*) of the same season an equilibrium quota, corresponding to 15 per cent. of the total; the qualities and grades of these coffees will be decided by the D. N. C.

The quantity of coffee purchased by the D. N. C. except that to be used for industrial purposes or for publicity will be eliminated from the market.

Arrivals at the ports of shipment were regulated by the D. N. C. so that the stocks during the 1939-40 commercial season should be maintained within the following limits: Santos 291 million lb., Nitcheroy 93 million lb., Victoria 40 million lb., Paranaguá 20 million lb.; Angra do Reis 13 million lb.; Bahia 8 million lb.; Recife 7 million lb.; a total of available exportable stocks of 471 million lb. The D. N. C. is authorized to increase or reduce the corresponding figures to the various ports of shipments according to the requirements of the world coffee market.

In addition, the Congress of the coffee States confirmed the prohibition up to June 30, 1941 of new plantations in the national territory and fixed the general lines of the coffee policy of Brazil, both at home and abroad, for increas-

ing coffee exports. In regard to the 1940-41 season, the equilibrium quotas are again to be fixed by the D. N. C., the existence of which is prolonged to June 30, 1941.

These measures were later modified, when the D. N. C. acceded to the request of planters to exclude rain-damaged coffee from the quota and adopted less rigorous criteria in the determination of the qualities of preferential quotas.

In addition, by decree of December 2, the Brazilian Government authorized the D. N. C. to carry out an extraordinary war-risk insurance, as defined by the legislation in course and international agreements, for all exports destined to the dangerous zones of Europe, Asia and Africa. The insurance covers their shipment up to unloading in the ports of destination and in the case of loss by torpedoing or confiscation, the indemnity will be made exclusively in the form of coffee. This formula, proposed by the coffee importers, was immediately accepted by the Brazilian Government which, in order to cover possible

Quantities of Coffee destroyed in Brazil by seasons.

(ooo pounds)

SEASON (July 1-June 30)	Production	Quantities destroyed			Percentage of production
		First half-year	Second half-year	Total	
					%
1931-32	2,869,767 (1)	373,685	720,694 (2)	1,094,379	38.1
1932-33	3,385,650	513,458	816,154	1,329,612	39.3
1933-34	3,916,746	1,023,830	436,296	1,460,126	37.3
1934-35	3,643,151	657,200	134,042	791,242	21.7
1935-36	2,504,239	89,949	104,059	194,008	7.7
1936-37	3,476,702	389,558	1,051,388	1,440,916	41.4
1937-38	2,974,046	1,223,790	693,577	1,917,367	64.5
1938-39	2,923,339	365,307	248,903	614,210	21.0
1939-40	2,755,787	216,715 (3)	41,227	...	...

(1) Seven months — (2) Thirteen months — (3) Two months January to February 1940

losses, decided to retain part of the coffee intended for destruction. This circumstance, together with the low yields obtained during the present coffee season, explains the very considerable relaxation of the policy of coffee destruction in recent months. The change in the commercial policy of Brazil had already caused a very considerable contraction during the 1938-39 season, the quantity of coffee eliminated from the market having fallen from a maximum of 1,917 million lb in 1937-38 to 614 million lb. in 1938-39. This figure is the lowest registered in the country since the beginning of the policy of coffee destruction, with the exception of the 1935-36 season. The tendency to slow down the destruction of coffee has been accentuated during the present season; the quantity destroyed during the first eight months of this season (July 1, 1939 to February 29, 1940) totals only 258 million lb., against 441 million lb. in the same period of last season. The surplus stocks which have been destroyed from 1931 to the end of February 1940 total 9,100 million lb., a quantity which would roughly cover world requirement for two and a half years.

In Colombia the emergency financial and commercial measures taken in 1938-39 were maintained during the present season. In addition, the annual

Congress of the "Federacion Nacional de Cafeteros" requested an increase in the existing tax on coffee exports, in order to carry out and if possible to intensify, the programme of assistance for planters and of publicity for Colombian coffee abroad. By a decree of April 25, 1940, the Government fixed a premium of 2 pesos colombian in favour of planters for each bag of 154 lb. exported from May.

In Venezuela the Government maintained for the present season the bonus of 22 bolivars per bag of 100 lb. exported; in addition, the sum of 5 million bolivars was voted for a loan to the most distressed planters. Finally, as an emergency measure, required owing to the loss of the German market, which absorbed very large quantities of coffee from Venezuela, the Government fixed minimum prices on the domestic market according to quality.

The Cuban Government decided to establish a bank for financing coffee cultivation and the coffee industry, and decided that 30 per cent. of the present season's crop should be exported. In addition, the minimum selling prices on the domestic market and the export bonus, already in force in 1938-39, were continued.

Finally, all the producing and exporting countries have adopted new measures during the present coffee season, particularly in view of the fact that a number of countries, especially in Europe, have regulated coffee imports and consumption among the civil population since the outbreak of hostilities.

In France the Government, having ordered a standstill on all coffee lying in public warehouses, granted the sole right of import of coffee to the Département d'Approvisionnement Général of the Ministry of Agriculture. Coffee distribution among the civil population was controlled with fixed prices.

In Germany coffee imports were greatly impeded by the economic blockade and the substitute industry, which has a remarkable technical and financial organization, developed enormously.

In Italy, after a period of five months of suspension of the sale of coffee to the public, from February onwards the Government authorized its distribution among the civil population at a ration of 50 gr. (1.76 oz.) of roasted coffee per month. At the same time bars were again authorized to sell coffee for immediate consumption.

The Swedish Government as from December 1 imposed an extraordinary tax on the sale of coffee, the distribution of which was rationed to the civil population at 500 gr. (17.6 oz.) per month.

In the Netherlands, where coffee imports were formerly duty-free, a tariff varying from a minimum of 7 fl. to a maximum of 26 fl. per 100 kg. (220 lb.) was imposed on coffee as from February 10. Of the extra-European countries Canada applied a war tariff on coffee imports of 10 cents per lb.

Prices.

Prices in gold frs. per quintal of the two Brazilian varieties "Santos No. 4" and "Rio No. 7" in New York continued to decline during 1939, but the fall was relatively more marked in the case of "Santos No. 4". For the latter variety the lowest monthly average in 1939, as in 1938, was in April. In May quotations

showed a slight recovery and in June continued at the same level. The first month of the new commercial season showed a new decline. During to the August-October quarter, in spite of the war, in conjunction with considerable market activity, prices improved, touching the highest levels of the year in September; since then quotations for this variety again have shown a tendency to fall. The average level for 1939 is the lowest recorded in Brazil and shows a reduction of 35 per cent. on the level of October 1937, previous to the new policy adopted by Brazil.

Quotations for "Rio No. 7" in New York were fairly steady in 1939. Monthly variations were not as marked as in the case of the "Santos" variety, the difference between the maximum and minimum prices of the year being only 2.16 gold frs. per quintal. The average for 1939 is the lowest of the series considered, but is not far below the average of the previous year.

*Prices of Coffee "Santos No. 4", "Rio No. 7", "Medellin"
and "Manizales" at New York.*

(Price in gold francs per quintal)

Yearly average	Santos No. 4	Rio No. 7	Medellin	Manizales
1928	264 94	188 75	321 43	317.20
1929	253 15	180 26	270 01	272 07
1930	150 89	99 55	210 71	196 99
1931	99 96	70 40	306 80	177 68
1932	121 91	91 04	139 98	129.69
1933	85 08	72 15	101 46	96 05
1934	76 12	66 97	98 07	93 24
1935	60 73	48 76	73 60	69 60
1936	63 92	50 25	80 97	76 04
1937	74 43	59 28	82 26	78 28
1938	52 88	35 70	77 67	74 03
1939	50 60	35 12	82 80	78 28

Monthly average	Santos No. 4		Rio No. 7		Medellin		Manizales	
	1938	1939	1938	1939	1938	1939	1938	1939
January	58 17	52 30	38 80	35 43	71 80	86 92	65 05	84 35
February	54 39	52 30	37 12	35 02	69 51	80 17	62 96	76 80
March	50 61	50 21	36 71	34 55	67 01	76 80	62 76	73 42
April	48 93	48 52	32 86	34 55	64 72	78 48	61 28	74 23
May	51 42	49 74	31 65	34 55	69 78	84 35	67.82	81 80
June	50 61	49 74	32 86	35 43	71 94	88 61	69 64	85 23
July	51 42	48 93	32 86	34 55	77 40	88 13	74 10	82 47
August	53 58	51 02	37 52	34 55	80 04	88 00	76 59	81 05
September	53 11	52 40	37 93	35 43	81 12	89 75	78 82	84 08
October	53 99	52 30	37 12	35 43	90 97	86 38	87 59	80 85
November	54 80	50.41	37 12	36 71	96 23	76 93	93 67	71 87
December	53 58	49 33	35 83	35 23	91 71	68 97	88 40	63 03

The prices of the two Colombian varieties "Medellín" and "Manizales" at New York show, on the contrary, fairly marked improvement on the previous year. For the "Medellín" variety, monthly oscillations were fairly heavy. Quotations in the first quarter of 1939 declined considerably. In April there was good recovery, which continued almost without interruption until September, when the average monthly price reached the highest level of the year. Subsequently prices showed a decline in trend until the end of the year, reaching their minimum in December. The average level for 1939, however, was slightly higher than in 1937, which was the highest figure for the last five years. Quotations during the first two months of the present year declined still further on the December prices.

Prices of the "Manizales" variety also showed a decline in trend in the first quarter of 1939. In the April to June quarter there was a fairly good recovery. The prices of the second half year again showed a tendency to decline, which was only checked in September. The level for 1939, however, was higher than that of the previous year and was almost the same as the average for 1937, which, as in the case of the "Medellín" variety, was the highest of the last five years.

Conclusion.

The principal features of the present coffee season may be summarized as follows:

The crisis of over-production of coffee was less marked during the 1939-40 season, as a result of the exceptionally poor crop obtained in Brazil and the policy of destruction pursued by this country since 1931. Equilibrium, however, between exportable supplies and world requirements has not yet been attained, although the present statistical position must be considered very much improved. Even in the most unfavourable seasons, world exportable supplies exceed, in fact, average world consumption by 900 to 1,100 million lb. or about one quarter. The reversal of Brazil's policy has also contributed to improve the situation on the world market, which in 1938 and in 1939 absorbed very much larger than average quantities of coffee.

The position held by Brazil in world supplies has improved considerably in the last two years, exports having reached exceptionally high levels.

The share of the producers of "Milds" showed a fairly considerable decline in 1938 and 1939, compared with the record figure of 1937, but this decline, particularly in the case of 1938, was largely due to the smaller crops obtained in these countries.

The results of the first two years of the competitive campaign is considered satisfactory, both for Brazil, whose principal object was to increase exports while reducing prices and for Colombia, which has been able to dispose of its exportable surplus, with hardly any difficulty, at comparatively good prices.

The war has created a new situation on the world coffee market, the effects of which it is not possible to forecast, particularly in Europe, which normally absorbs over 40 per cent of the world total. Unfortunately, the largest coffee

consumers in this continent are belligerents, and these countries, like most of the neutral countries, have regulated imports and distribution among the civil population. Theoretically, coffee consumption in time of war should not suffer any notable reduction for the decrease in the consumption of the civil population is accompanied by an increase in that of the armed forces. But, as a result of the economic blockade, the lack of shipping and general currency difficulties, a fairly heavy decline in European imports must be forecast for the duration of the war. For the disposal of the coffee crops during this period of political and commercial upheaval, there remains the United States, which absorbs more than 50 per cent. of the world total. The present general situation, which is already rather precarious, is marked by a very sharp competition on the American market; as a result of this competition coffee prices, particularly of "Milds", have declined considerably since November.

A. DI FULVIO.

Groundnuts.

Argentina: The groundnuts crop is giving good yields except in certain drought-stricken areas of the province of Entre Rios.

Egypt: Preparation of land for sowing of the groundnuts crop is progressing. A few early areas were sown towards the end of the month.

Colza and Sesame.

Hungary: A large proportion of the winter colza crops was destroyed by frost and the weight of the snow. Spring colza is growing slowly owing to cold wet weather. On May 8 the crop condition of colza was poor in most districts.

Netherlands: Colza suffered from the cold weather during the winter, which was prolonged into the spring, and from the very heavy precipitation. The crop condition of colza in the third decade of April was 49 in the system of the country against 35 in April 1930.

India (Telegram of May 20): According to the final estimate, the area cultivated to rape and mustard this year was about 5,070,000 acres against 5,535,000 in 1938-39 and 5,617,000 on the average of the five years ending 1937-38; percentages 107.9 and 106.3. The corresponding production is estimated at about 24,573,000 centals against 20,586,000 and 21,594,000; percentages 119.4 and 113.8.

CURRENT INFORMATION ON FODDER CROPS.

Estonia: Fodder production last year was poor. Consequently feeding conditions for milch cows during the winter were not satisfactory.

France: On May 15 fodder crops were 3 to 4 weeks late compared with normal (*Bulletin des Halles*).

Hungary: On May 8 mangels were growing well. Clover and alfalfa have on the whole developed poorly and are thin. Heavy rain stimulated the growth of permanent meadows. At this date some permanent meadows were still flooded. Pastures also has a good appearance. In some districts a premature use of pasture was made for lack of fodder supplies, with a result of deterioration in crop condition

Ireland: The weather during April was comparatively mild and was favourable for the growth of meadows and pastures.

Netherlands: The severe cold of the winter, which continued into the spring, and the exceptionally heavy precipitation damaged fodder crops, especially red clover, which in certain districts was destroyed at the end of April. The crop condition in the system of the country in the third decade of April 1940 was as follows, compared with April 1939 in brackets: permanent meadows 53 (54), red and white clover 53 (40), alfalfa 61 (54)

Switzerland: The growth of permanent and rotation meadows progressed satisfactorily during April. Grazing out began generally in May. The crop condition of permanent meadows in the system of the country was 79 on May 1, against 78 on April 1 and 82 on May 1, 1939, corresponding figures for rotation meadows (clover, alfalfa, etc.) are 75, 75 and 84.

Egypt: Growth of bersim crop is progressing normally. Fourth cutting of irrigated bersim is in progress. Flowering is progressing in areas assigned to seed production.

In Upper Egypt harvesting of unirrigated areas assigned to seed production is nearly over. The yield per acre is expected to be normal. Crop condition on May 1 was 99, the same as on April 1, against 101 on May 1, 1939.

LIVESTOCK AND DERIVATIVES

PIG POPULATION IN DENMARK. *

(Thousands)

CLASSIFICATION	1939		1939								1939	
	March 23	Febr 10	Dec. 30	Nov. 18	Oct. 7	Aug. 26	July 15	June 17	May 6	March 25	Febr. 17	Dec. 31
Boars for breeding	18	17	17	17	18	18	18	17	18	18	18	17
Sows in farrow for first time . . .	89	89	80	63	62	65	76	82	111	119	109	82
Othersows in farrow	165	169	162	176	189	192	171	163	160	152	145	143
Sows in milk . . .	88	80	95	86	81	85	99	101	81	78	77	72
Sows not yet covered (and not for slaughter) .	24	25	21	24	25	27	27	23	20	19	19	23
Sows for slaughter.	16	12	12	15	15	9	10	9	9	9	9	9
Total sows	382	375	370	364	372	378	383	378	381	377	359	329
Sucking pigs not weaned . . .	734	662	804	735	696	731	841	862	684	652	648	603
Young and adult pigs for slaughter:												
Weaned pigs under 35 kg . .	712	769	749	732	767	839	771	660	657	636	618	639
Pigs of 35 and under 60 kg. .	686	659	657	697	766	663	641	589	571	550	571	615
Fat pigs of 60 kg. and over .	534	558	537	685	573	535	473	491	443	491	505	503
Total pigs . . .	3,066	3,040	3,134	3,230	3,192	3,164	3,127	2,997	2,754	2,724	2,719	2,706

* Rural districts.

LIVESTOCK AND POULTRY IN YUGOSLAVIA. 1)

CLASSIFICATION	END OF DECEMBER			
	1939	1938	1937	1936
<i>Horses</i>	1 273,359	1 264 470	1,248,852	1 216 085
Colts and fillies under 3 years old	211,764	208 095	204,618	196 347
Stallions	16 780	16,160	16,684	17 947
Geldings	524 635	520,031	514,279	496 309
Mares	520,180	520,184	513,271	505 482
<i>Asses</i>	123 071	123 058	123,896	123 461
<i>Mules</i>	19,475	19,265	18,826	17 987
<i>Cattle</i>	4,224,595	4 267,339	4,169,192	4 073 729
Calves under 1 year old	581,119	593 379	584,514	564 398
Cattle 1 year old and above	636,604	640 854	624,377	614 457
Bulls	61 477	62 843	63,036	63 543
Oxen	961,730	976 202	951 610	924 099
Cows and heifers	1 983 665	1 994 061	1,945 655	1 907 272
<i>Buffaloes</i>	38,004	37,841	36,340	37 217
<i>Sheep</i>	10,153 798	10 137,357	9 908,638	9 568 338
Lambs under 1 year old	1 861,354	1 870 792	1,828,823	1 773 987
Rams for service	414 230	411 852	400 765	393 659
Other rams	2)	2)	2)	245,787
Breeding ewes	6 975,158	6 954 203	6 825 255	6 580 922
Other ewes	2) 903,056	2) 900 510	2) 853,825	573 983
<i>Goats</i>	1,866,141	1 890 386	1,901,363	1 905 993
Kids under 1 year old	397 551	404 983	412,574	413 211
Goats	1 468,590	1 485 403	1,488,789	1 492 782
<i>Pigs</i>	3,503 454	3,450,884	3,179,661	3 126 241
Young pigs under 1 year old	1,616 643	1,595 677	1,508,445	1 483 330
Boars	56 130	54 694	54,761	55 193
Brood sows	840 387	832 140	783,086	756 618
Other pigs	990,294	968 373	833,369	831 100
<i>Poultry</i>	22,453,730	22,763,164	22,414,597	21,505,246
Fowls	19,225,725	19,418 935	19,114 371	18,355,777
Geese	1,325 031	1,339,218	1,329,577	1,266,394
Ducks	1,083 807	1,110,948	1,086,415	1,061,563
Turkeys	819 167	885,063	884 234	821,512

1) On farms only — 2) Included under "other ewes" — 3) "Including other rams"

ANIMALS SLAUGHTERED IN YUGOSLAVIA:

ANIMALS SLAUGHTERED IN PUBLIC ABATTOIRS	1939	1938	1937	1936
	Number			
<i>Cattle</i>	679,349	684,533	684,990	737,807
Calves	310,257	332,927	322,383	350,588
Bullocks	42,094	41,836	38,529	39,223
Bulls	22,461	21,293	11,200	13,984
Oxen	99,599	99,705	113,498	131,629
Heifers	66,306	60,618	62,671	62,691
Cows	134,632	128,154	136,709	139,692
<i>Buffaloes</i>	2,047	2,322	2,812	2,416
Young buffaloes	1,293	764	1,315	0
Adults	754	1,558	1,497	2,416
<i>Pigs</i>	789,553	772,360	740,138	699,655
Suckling pigs	0	0	0	0
Young pigs	99,961	92,185	88,152	94,798
Unfattened pigs	0	0	0	5,902
Fat pigs	689,592	680,175	651,986	598,955
<i>Sheep</i>	1,111,145	1,082,526	1,140,067	1,018,585
Lambs	777,033	769,914	819,272	721,870
Ewes	334,112	312,612	320,795	296,715
<i>Goats</i>	181,982	178,009	211,881	204,258
Kids	136,433	129,914	165,702	158,912
Goats	45,549	48,095	46,179	45,346
<i>Horses</i>	2,415	226	396	633
Foals	23	10	0	0
Horses	2,392	216	396	633

POULTRY AND EGG PRODUCTION IN JAPAN.

CLASSIFICATION	July 1 1939	July 1 1938	July 1 1937	July 1 1936	July 1 1935	July 1 1934	July 1 1933
<i>Fowls</i>	49,980,385	48,395,452	51,265,892	50,793,143	51,698,450	53,315,720	50,910,994
over 6 months old	28,773,052	28,366,048	30,220,731	30,004,559	31,024,131	30,832,118	29,961,647
under 6 months old	21,207,333	20,029,404	21,045,161	20,788,584	20,674,319	22,483,602	20,949,347
<i>Ducks</i>	472,181	458,203	512,160	498,587	552,098	560,044	467,723
over 6 months old	227,710	206,366	245,085	276,271	287,082	262,539	240,843
under 6 months old	244,471	251,837	267,075	222,316	265,016	297,505	226,880
	1938-39	1937-38	1936-37	1935-36	1934-35	1933-34	1932-33
Hen's eggs (thousands) (1)	3,488,971	3,471,839	3,642,989	3,537,310	3,608,676	3,535,071	3,408,888
Duck's eggs (thousands) (1)	15,693	12,467	14,758	14,720	15,887	15,482	12,227

(1) July 1 to June 30.

CHEESE PRODUCTION AND MARKETING IN 1939.

Production.

While for butter production cow's milk is mainly if not exclusively used, in the production of cheese not only cow's milk is used but also ewe's milk and goat's milk to a considerable extent. Cheese production therefore in general constitutes the only important use to which these other types of milk are put, apart from their direct consumption in the fresh state by man or animals. As regards cow's milk, in those countries where the manufacture of dairy products is fairly well developed the importance of cheese production relative to that of other forms of milk utilization - i. e. liquid consumption and butter production - still differs considerably from country to country. Partly for the same reason the production of the different types of cheese is developed to different degrees, so that in the main cheese-producing areas the relative proportions in which fat cheese and skimmed milk cheese or sour milk cheese are produced also show marked differences. However, it would be beyond the scope of the present general survey to consider these differences.

The statistical records of cheese production of many countries distinguish certain types or classes of cheeses. This is, however, not always the case. Moreover these classes are constituted according to numerous different standpoints, this being due to the existence of a multiplicity of criteria according to which cheeses may be distinguished. Hence in this article we shall be considering only the total cheese production. But it must always be borne in mind that in considering cheese production the employment of such single totals provides results less suitable for comparison than in the case of international trade, where however, on account of the differences involved they should be handled also with caution. The types of cheese favoured in international trade are naturally those which keep well, whilst those which easily deteriorate or have a heavy water content or fetch a low price have less importance. The figures for total production should not, of course, exclude such inferior qualities, so that the value of the figures quoted in many cases suffers from the fact that they differ as regards what they include under the term "cheeses".

In the tables showing cheese production the outputs of the more important countries are considered as a whole and arranged in order of the amounts produced as shown by the available statistics. A more complete and detailed table on cheese production will be published for the first time in this year's issue of the International Yearbook of Agricultural Statistics. As regards the arrangement in order of output it should be noted that the degree to which the statistics cover total cheese production often differs considerably from country to country. Moreover the absence of up-to-date figures for certain countries adds to the difficulty of providing a really satisfactory arrangement of the countries according to volume of production.

The country with the greatest cheese production is the United States of America, mostly, of course, on account of the great extent of her territory. Her

cheese production rose by a third from 1932 to 1937, the production for the latter year having been not only double that of 1927 but also the greatest on record. In the two following years 1938 and 1939, however, a continuous and marked decline has been noticeable.

For the next three countries, Germany, France and Italy, the production figures, as shown by the official statistics, are all of about the same magnitude.

Production of Cheese in the principal producing Countries.

(ooo lb.)

COUNTRIES		1939 1938-39	1938 1937-38	1937 1936-37	1936 1935-36	1935 1934-35	1934 1933-34	1933 1932-33	1932 1931-32
United States	<i>d</i>	682,113	725,323	781,321	762,582	730,614	682,333	644,634	587,534
	<i>d</i>	(2)	(3) 482,814	483,696	471,350	390,881	369,937	372,582	339,072
Germany (1)	<i>f</i>		15,432	15,432	22,046	22,046	—	—	—
	<i>Total</i>		(3) 498,246	499,128	493,396	412,927	—	—	—
Austria		—	—	70,548	—	—	66,139	—	—
France	<i>d + f</i>	..	(4) 478,405	(2) 494,058	—	—	—	—	—
Italy	<i>d + f</i>		491,412	491,412	—	—	—	—	—
Netherlands	<i>d + f</i>	265,878	275,358	274,697	267,422	258,383	256,619	267,422	263,233
New Zealand	<i>d</i>	190,921	198,196	204,590	198,196	214,510	239,202	231,927	199,519
Canada	<i>d + f</i>	..	122,357	132,057	120,373	101,854	100,531	111,995	121,696
Greece	<i>d</i>		120,814	141,978	136,687	121,696	117,948	124,782	97,665
Switzerland	<i>d + f</i>		115,964	117,727	107,806	107,806	109,350	120,814	108,247
United Kingdom									
Great Britain (5)	<i>d + f</i>	..	97,004	84,658	122,577	127,869	112,216	—	—
Argentina	<i>d</i>	114,641	94,138	74,296	72,091	49,825	48,943	51,147	41,006
Denmark	<i>d</i>	...	78,705	67,682	73,194	63,934	60,627	68,784	57,540
Sweden				74,516	74,957	66,139	64,816	59,084	67,021
Australia	<i>d + f</i>	66,580	56,659	44,534	38,581	39,904	38,361	37,038	31,306
Czecho-Slovakia	<i>d</i>				62,611	56,218	51,588	49,163	—
Brazil	<i>d</i>		58,864	57,320	41,006	41,888	40,565	—	—
Norway	<i>d</i>	40,786	41,006	40,124	39,904	38,361	35,274	34,172	33,069
Bulgaria	<i>d</i>			26,896	24,692	23,810	—	—	—

f — Farm cheese — *d* — Factory cheese

(1) According to the returns of the *Hauptvereinigung der Deutschen Milchwirtschaft*, in addition to dairy factory production, cheese production from sour milk in specialized establishments should be added, as follows (in thousand lb.) 1934 81,571, 1935 93,035, 1936 100,791, 1937 112,436, 1938 116,845. Total production (in thousand lb.) would thus be 1934 473,555, 1935 505,963, 1936 603,187, 1937 611,564, 1938 611,651 — (2) See figures in the text — (3) Provisional estimate — (4) Calculated — (5) Production in Northern Ireland is small and is not estimated.

But this similarity seems in part to be due to the fact that the bases of compilation of the statistics differ. In the case of Germany, a great increase in production is obvious. But the production of sour milk cheese in specialized factories outside the dairies, which is not included in the official statistics, also shows a marked increase. The *Hauptvereinigung der deutschen Milch- und Fettwirtschaft* gives the production in dairies within the first nine months of 1939 and the whole year 1938 as having amounted to 166,738,000 lb. and 162,662,000 lb. respectively of hard cheeses and 123,684,000 and 149,173,000 lb. respectively of soft cheeses. Statistics for the 1939 production of curds for human consumption and sour milk cheeses are not yet available. The figures show that the

production of hard cheeses in the first nine months of 1939 already considerably exceeded that for the whole year 1938, which output in its turn, together with the equally great output in 1936, had greatly exceeded that recorded for all other years. In the case of soft cheeses too the volume of production has shown an increase as compared with the relatively small production of 1938 and amounts almost exactly to three-quarters of the record output of 1936.

In the case of France the statistics refer only to that portion of the cheese output which is produced from cow's milk. The figures for 1938 were based on the statistics of the utilization of milk for cheese making. The decline in production is to be attributed to foot-and-mouth disease. It should be mentioned that the statistics for 1929 show, in addition to the 430,758,000 lb. of cheese produced from cow's milk, an output of 33,069,000 lb. produced from ewe's milk and 41,447,000 lb. from goat's milk, giving a total production of 503,301,000 lb. for 1929. In considering the increase in the production of cheese from cow's milk it should be borne in mind that the statistics for 1929 and 1937 were collected by methods differing in certain essential respects.

For Italy, as statistics are only available for the year 1937, covering all types of cheese production, nothing definite can be said about the development of cheese production. In the Netherlands the output of cheese has remained steady at its normal level. In New Zealand, however, cheese production has declined by about one-fifth since 1934, this constituting one of the few cases of a retrogression.

Of these six countries with the greatest cheese production the two first, the United States and Germany, in addition, show great requirements for cheese imports. France, which occupies the third position amongst the world's cheese producers also has a considerable trade in various types of cheeses, exporting some in order to import others, so that the total supply available for home consumption is little affected. The three remaining countries, Italy, the Netherlands and New Zealand are all countries with definite export surpluses, although the relations between total production and exports are very different. The Netherlands dispose of about half their production on world markets and Italy exports about one-tenth of its output, whilst New Zealand keeps for home consumption only about one-tenth of its production.

Of the minor producing countries, in Greece over half the cheese output derives from ewe's milk. In the United Kingdom cheese production has in some years even exceeded that of Switzerland, but as regards the satisfaction of the home demand for cheese it is of secondary importance when compared with the volume of cheese imports. Argentina and Australia are worthy of mention on account of the increases in cheese production which have taken place in these countries of recent years.

Importance of Cheese Production in the Dairy Industry.

The importance of cheese production in the national dairy industry varies very considerably from country to country. We cannot, however, proceed to consider here the reasons for this differing importance of cheese production,

but must content ourselves with giving some indications of the various conditions from such information as is available.

The most appropriate standard by which to measure the importance of cheese production in the dairy industry is undoubtedly the quantity of milk used, for only by reference to this raw material can we find a factor common to all production, so that comparisons become at all possible. However, when making a comparison of the quantities of milk devoted to cheese and butter production respectively it must always be borne in mind that for the production of butter two or three times as much milk is needed as for the production of an equal quantity of cheese. Also the available statistics regarding the quantities of milk used refer only to cow's milk, so that in the case of cheese production the often quite important quantities of goat's and ewe's milk used are ignored whilst in butter production these other types of milk play no part worth mentioning. Thus a simple comparison of the quantities of milk used gives an exaggerated idea of the importance of the production of butter relative to that of cheese.

The estimate of the proportionate distribution of milk according to utilization in the various countries is also made difficult by the fact that the estimates of the

Relative quantities of Cow's Milk used for making Butter and Cheese (1937).

COUNTRIES	Cow's milk transformed into				
	Butter	Cheese	Butter	Cheese	Butter and cheese together
	Million gallons		Per cent. of total production of cow's milk.		
United States	(1) 4,047.55	(1) 857.90	c. 39	c. 8	c. 47
Germany	3,084.06	312.37	55	6	(2) 58
France	983.29	433.36	31	14	45
Italy	(1) 241.97	(1) 351.96	c. 15	c. 23	38
Netherlands	(1) 549.94	(1) 263.97	c. 49	c. 23	72
New Zealand	699.50	182.58	72	19	91
Canada	829.31	147.38	54	10	64
Denmark	899.70	30.80	80	3	83
Australia	818.31	44.00	80	4	84

(1) Estimates. — (2) See explanation in the text.

quantities of milk not entering into commerce — *i. e.* milk used for domestic consumption or more particularly as an animal food — are of very varying accuracy. For this reason the percentage even in the somewhat simplified form given here suggests a degree of accuracy well beyond that actually obtained. For some countries such as the United States of America, Italy and the Netherlands no official data were available as regards the quantities of milk used for butter and cheese production respectively, so that it was only possible to give estimates. In Germany about 3 per cent. of the total milk production

is used for the production both of butter and cheese, which explains the difference in the total of the two percentages. The table is based on the conditions of 1937.

In addition to the figures of the seven most important cheese-producing countries the table gives the figures for Denmark and Australia, thus covering all the great butter-producing countries. The utilization in the various countries shows great differences, so that the close resemblance between Denmark and Australia appears all the more remarkable. But however different may be the proportions of milk utilization in the different countries the greater quantities, and generally the very much greater quantities, are used for butter production. The one exception to this rule is Italy, where in addition to the 16 million hectolitres shown in the table as devoted to cheese production, some further 4 mil-

Comparative Production of Butter and Cheese (1937)

(million lb.)

COUNTRIES	United States	Germany	France	Italy	Netherlands	New Zealand	Canada	Denmark	Australia
Cheese .	781	612	494	491	275	205	132	68	45
Butter .	1,627	1,149	458	85	222	398	360	404	394

lion hectolitres of ewe's milk are used for the same purpose, so that the resulting 20 million hectolitres of milk represents about double the amount devoted to butter production.

For the same countries and the same year, 1937, the total butter and cheese production are compared. Here, however, we notice a rather remarkable difference from the table showing the uses to which the milk output was devoted, for the figures of cheese production exceed those of butter production not only in Italy but also in France and in the Netherlands. In the case of the two great countries with an import surplus, the United States and Germany, the production of cheese amounts to about one half that of butter. In France the cheese output seems not to exceed the butter output by much, but on the other hand, the table takes no account of the cheese produced from ewe's or goat's milk, which would give a figure for total cheese production of about 570,000,000 lb. Of the other countries, which all have important export surpluses of cheese only in Italy and the Netherlands does cheese production exceed butter production, whereas in the remaining countries it is the butter output which is more considerable.

Production of Processed Cheese.

Even though all cheese produced be destined for human consumption this does not mean that it all reaches the consumer in the form of natural cheese, to which alone what has as yet been said applies. On the contrary a consi-

derable part is first processed by melting. This way of using cheese has only attained importance during the course of the last twenty years.

The natural cheese is heated in special melting factories, emulsifying solutions generally being added in order to arrive at a product of uniform quality. These solutions contain e. g. citric acid, bisodium phosphate and soda. The melted cheese is poured into light airtight packings of which it takes the form on cooling. Especially cheeses in portions and cheeses in blocks are made. The melting interrupts the fermentation process and gives rise to a product which can be kept for a long time, this latter quality being further enhanced by the addition of chemicals such as hydrogen peroxide. Cheese processed in this way has the advantage that it keeps longer, that it is at once ready for

Production of Processed Cheese

(000 lb.)

COUNTRIES	1939	1938	1937	1936	1935	1934	1933	1932
Germany	...		70,608	66,769	67,839	67,389	68,337	—
Hungary	...	1,263	1,345	1,334	1,206	972	1,151	996
Canada	...	14,189	12,650	12,496	10,961	11,995	10,635	10,771

consumption, that the taste of any particular brand remains always the same, and that owing to the absence of any crust the whole cheese can be consumed. Furthermore it becomes possible by means of such a processing to make use of cheeses which would otherwise fetch only a low price because of some defect in their appearance. Originally indeed the main purpose of the melting process was to find a use for the low quality cheeses. But with the increasing popularity of processed cheeses the factories often found it necessary to conclude contracts with dairies, so that the low quality cheeses now again often have difficulty in finding a market.

The characteristics of processed cheese may resemble those of the natural cheese from which it is produced. Taste and appearance can, however, be affected by adding certain other substances. Furthermore, by adding greater quantities of water, soft cheese can be made out of hard cheese. In this way the amount of processed cheese produced, which in any case exceeds the amount of natural cheese used, can be still further increased. Thus, in Germany, owing to the increasing use of hard cheese combined with improved technical methods and the elimination of the less efficient factories, the yield increased from 119.3 per cent. in 1933 to 129.6 per cent. in 1936.

In all countries with a considerable production of cheese there must also be a processed cheese industry. Statistics, however, of so few countries are published that the above figures for Germany, Hungary and Canada must only be taken as representative examples. For some other countries, such as Switzerland and the Netherlands, some indication may be obtained from the export statistics. For example, about a twentieth of the Netherlands cheese exports'

consists of processed cheese, and similarly about a fifth of Swiss exports. Without examining in detail the German and Hungarian statistics, it may be noted that in Germany one tenth of the total cheese consumption (including curds for human consumption) consists of processed cheese. These few statistics show that the processed cheese industry is of appreciable importance.

International Trade.

In the international trade in cheese, although the exports of certain countries have undergone fluctuations, the exports of the principal countries taken as a whole show no change as compared with those of the same period of the previous year. Most noticeable of all is the heavy decline in Netherlands' exports, which reached the lowest figure since 1922. This decline, was, however,

Exports of Cheese.

(000 lb.)

COUNTRIES	1939	1935 A	1938 B	1937	1936	1935	1934	1933
New Zealand	187,259	—	180,381	184,494	185,720	193,489	222,266	222,088
Netherlands	114,531	—	128,953	138,045	125,311	134,597	134,892	140,902
Canada	(1) 28,138	(1) 24,152	80,989	88,955	81,891	55,720	61,167	74,168
Italy	(1) 27,690	(1) 28,171	53,286	52,680	42,843	61,223	55,283	52,779
Switzerland	46,432	—	49,348	38,852	40,737	40,248	39,145	45,347
Australia	(3) 30,126	(3) 25,084	35,181	18,689	13,058	16,003	12,430	10,895
France	(1) 17,712	(1) 15,022	26,467	24,747	23,345	24,628	25,973	25,034
Denmark	21,140	—	20,084	20,668	21,008	14,689	13,891	22,220
Finland	(2) 8,073	(2) 8,807	14,930	14,575	10,864	9,365	8,523	9,207
<i>Total</i>			589,619	581,705	544,777	549,962	573,570	602,640
WORLD TOTAL			635,335	633,386	593,226	598,405	618,712	645,677

A Quantities for the months to which the 1939 data relate

B Full year

(1) Up to July 31 — (2) Up to August 31 (3) Up to October 31

balanced by increased exports from Australia and New Zealand the latter country's exports having somewhat exceeded those recorded in 1936 and 1937.

The total imports of the principal importing countries have shown a slight increase in the period under consideration. This has been due to the increased quantities taken by the United Kingdom and the United States slightly exceeding the reductions in imports of the other three countries.

However, in view of the incompleteness of the trade statistics it would be of little use to examine the international trade in cheese in great detail. In particular we shall dispense with a detailed examination of the particular situation as regards the various types of cheese. Such an examination was undertaken in each of the two previous years, and since then there has been little change to note. Hence it will suffice to mention only a few of

Imports of Cheese

(000 lb.)

COUNTRIES	1933	1938 A	1938 B	1937	1936	1935	1934	1933
United Kingdom (1)	(1) 216 669	(2) 209 980	326 032	326 455	297 025	300 773	331,335	337,754
Germany	(3) 38 367	(3) 41,714	71 675	81 342	61,507	61,661	74 488	90 923
United States	59 073	—	54,432	60,650	59 849	48 934	47,534	48,398
Belgo Luxembourg Union	52 016	—	53 350	49,983	50,834	50 740	47 428	48 418
France	(3) 17,650	(3) 17 741	31 301	29 363	43 498	34 782	35,151	46 105
<i>Total</i>			536 790	547 793	501,713	496 890	535,936	571 598
WORLD TOTAL			626,697	634,504	586,035	582,792	619,770	647,438

A Quantities for the months to which the 1939 data relate

B Full year

(1) Re exports have been deducted — (.) Up to August 31 — (3) Up to July 31

the outstanding features. Much the greater part of the cheese entering into international trade is of the hard type. Even the important exporting countries nevertheless show considerable cheese imports. This is due to the fact that despite the great technical progress achieved in cheese making the production of many types of cheese is still not as successfully carried out in other areas as in the districts to which they are native. Hence certain countries continue to enjoy something very like a monopoly of the export of some types of cheese.

Prices.

The cheese market in 1939 showed a development fundamentally different from that shown by the butter market. This was not only due to the basic fact that because of the greater length of the production period of cheese, more distant events may affect the cheese market. Already at the beginning of the year the price fluctuations were less than in the butter market. Moreover, in contrast to the conditions prevailing in the butter market as early as the first months of the year, the price situation was very depressed and prices lower than in the previous year, as a result apparently, not only of a weakened demand, but also of the poorer quality of the supply. The great difference noticeable in the butter market between the high prices at the beginning of the year and the low prices subsequently prevailing, was not evident in the cheese market although in the latter also conditions continued to develop unfavourably. Prices mostly did not show much change but continued to remain at a relatively low level until the outbreak of the war. In contrast to conditions prevailing on the butter market, the outbreak of the war in many cases produced rises in cheese prices which were also subsequently maintained. However, the control measures adopted in most States prevented a further upward movement.

The same objections may be raised against price quotations in gold francs as were mentioned in last month's issue of the present Bulletin in the case of butter — namely the inadequate view of price development offered by strict

Average Prices of Cheese in Gold Francs per Quintal

DESCRIPTION	January	February	March	April	May	June	July	August	September	October	November	December	Year
Milano. Parmigiano-Reggiano: (1)													
1938	185.20	185.20	185.20	185.20	190.03	196.47	198.08	199.69	201.30	202.91	185.20	186.81	191.77
1939	188.82	190.43	191.64	193.65	194.86	196.79	198.48	199.69	197.81	194.80	195.57	198.51	195.09
Milano. Gorgonzola, green, choice: (2)													
1938	128.83	128.83	128.83	128.83	128.83	128.19	114.34	120.38	124.81	124.60	123.20	114.34	124.50
1939	117.16	119.17	119.97	119.97	123.20	127.54	128.83	128.83	126.60	123.68	132.96	135.27	125.26
Alkmaar. Edam 40 +:													
1938	72.46	76.05	75.46	66.66	67.76	66.26	69.08	71.23	75.44	78.05	75.08	68.54	71.84
1939	66.53	65.44	59.04	53.87	57.23	55.63	53.96	52.29	75.55	84.30	67.01	67.32	63.18
Switzerland: Emmenthal for export:													
1938	162.06	162.93	161.59	161.13	160.10	160.34	160.46	160.49	150.52	150.84	150.56	150.22	157.60
1939	150.23	150.23	150.23	149.01	149.30	149.75	149.76	150.22	150.41	149.04	157.28	157.24	151.06
London. Italian Gorgonzola													
1938	173.04	172.04	170.65	166.82	166.27	156.09	138.17	137.58	140.54	142.69	134.54	128.63	152.25
1939	127.18	122.22	126.43	146.89	142.78	154.42	155.60	152.25	143.54	...	...	...	141.26
London. Edam 40 +, Dutch													
1938	99.76	99.57	92.96	77.86	84.07	79.29	76.02	78.41	83.58	88.27	95.37	91.49	87.22
1939	82.99	79.87	75.62	70.33	70.68	69.74	68.68	70.95	70.65	97.34	99.04	...	78.72
London. Canadian, finest white.													
1938	110.67	112.43	114.60	115.54	116.12	118.00	117.37	116.14	103.90	103.82	102.12	100.51	110.93
1939	102.10	103.04	102.32	101.97	101.62	101.14	105.26	87.58	—	78.95	92.20	92.20	97.13
London. New Zealand, finest white:													
1938	101.64	101.84	103.34	104.18	104.65	102.31	102.64	104.75	105.35	102.51	97.39	97.23	102.32
1939	97.41	93.05	86.09	84.68	75.51	85.15	88.91	81.77	74.31	76.54	88.64	88.64	85.06
Chicago. American, fresh:													
1938	115.60	108.65	102.91	95.08	94.01	94.28	94.95	86.45	85.03	91.71	89.28	99.13	96.42
1939	92.45	91.44	89.89	86.51	90.23	97.85	90.70	94.07	108.11	114.72	114.72	114.72	98.78

(1) To October 1938: 1936 production November 1938 to August 1939: 1937 production. September 1939 to December 1939: 1938 production. Maximum prices for choice qualities, free at station, packing included —

(2) Prices to retailers for choice qualities free at station, not including packing — (3) Nine months —

(4) Eleven months.

adherence to the system of giving prices by calendar months, and the general objections which may be raised against the whole principle of having gold franc prices. Furthermore differences in quality can affect cheese prices much more seriously than butter prices. Finally the course of prices may in the case of some cheeses be more or less suddenly broken when the new season's

product appears on the market. The date of this transition, however, may vary from year to year, and this is the cause of further variations.

When quotations are given for the same type of cheese in two different markets it does not necessarily follow that the qualities of the cheese are in both cases the same. Also the difference between the prices prevailing in an importing, as against an exporting country, cannot be equalled with the cost of carrying on trade between the two countries as the figures quoted for export countries in no case correspond to the selling prices of the export wholesale merchants. For this reason such quotations for the same varieties of cheese have not been placed together.

That 1939 prices in general are low is clearly evident from the table. Only the two quotations for Milan show a somewhat better average situation than in the previous year, although in the case of gorgonzola this rise was only due to the price rises of the two last months. As regards the London market the price regulations prevailing since the outbreak of the war are to be noted (see Crop Report for November 1939, page 1065). In Germany in August 1939 a price rise of about 4 per cent. was fixed for some sorts of cottage cheese (see Crop Report for February 1930, page 145).

The price changes given in the table show the following general development: a downward tendency led from the beginning of 1938 to a depression which reached its lowest points between the beginning and the middle of 1939, whilst the upward movement beginning in the latter part of 1939, has in some cases brought prices above the level prevailing at the beginning of 1938.

W. SCHUBRING.

CURRENT INFORMATION ON LIVESTOCK AND DERIVATIVES.

Estonia Owing to limited feed supplies for cows, milk production declined considerably.

Ireland. Following a winter when fodder supplies had to be used carefully, milk production did not quite come up to the seasonal average during April.

Switzerland According to the provisional results of the enquiry made by the Swiss Farmers' Union, milk deliveries to 760 cheese societies in March 1940, were 6.3 per cent. lower than in the same month of last year. Only the cantons of St. Gall and Thurgovia, where there was an attack of foot-and-mouth disease last year, show a slight increase. In the other cantons deliveries show reductions varying from 5 to 13 per cent.

Union of South Africa: Good rains fell in most parts of Cape Province in March and grazing improved considerably. Stock generally were in good condition, and good lamb and wool crops were reported from many areas. In Orange Free State, Transvaal and Natal the drought continued up to the middle of March but thereafter good rains fell and grazing greatly improved by the end of the month. Winter prospects for stock were fair, provided that the frosts did not come too early.

CURRENT INFORMATION ON SERICULTURE.

Italy: The condition of rearings on May 15 was favourable on the whole. Mulberry bushes were in good condition and the quantity of leaf was sufficient.

Japan: Owing to a shortage of labour and leaf, it is estimated that spring incubations were 4.2 per cent. smaller than those of 1939 (unofficial).

EGG PRICES IN THE NETHERLANDS.

Prices of white eggs, in florins per 100, average quality, 57/58 gr. each.

APELDOORN MARKET			BARNEVELD MARKET		
Date		Price	Date		Price
January	2, 1940	4 20	January	4, 1940	4 20
"	8, "	3 90	"	11, "	3 80
"	15, "	3 75	"	18, "	3 90
"	22, "	4 20	"	25, "	4 20
"	29, "	4 10	February	1, "	4 35
February	5, "	4 30	"	8, "	4 70
"	12, "	5 10	"	15, "	5 50
"	19, "	5 30	"	22, "	5 30
"	26, "	5 30	"	29, "	5 30
March	4, "	5 25	March	7, "	5 30
"	11, "	4 85	"	14, "	4 90
"	18, "	4 35	"	21, "	3 90
"	25, "	3 45	"	28, "	3 40
April	1, "	3 25	April	4, "	3 40
"	8, "	3 50	"	11, "	3 50
"	15, "	3 40			
Monthly averages.			Monthly averages:		
January	1940	4.03	January	1940	4.02
February	"	5.00	February	"	5.03
March	"	4.47	March	"	4.37

TRADE

The following countries, having suspended publication of trade statistics, do not appear in the tables: Germany, Bohemia-Moravia (Protectorate), Bulgaria, Denmark, Spain, Estonia, Finland, France, Ireland, Italy, Latvia, Lithuania, Norway, Poland and Danzig, United Kingdom, Sweden, Switzerland, U. S. S. R., Syria and Lebanon, Algeria, Madagascar, French Morocco, Tunisia.

COUNTRIES	MARCH				EIGHT MONTHS (August 1-March 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Wheat. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Hungary					(1) 15,173	(1) 10,331	(1) 0	(1) 0	16,316	0
Romania	1,419	1,404	0	0	14,346	18,005	0	0	27,571	0
Yugoslavia					(3) 3,909	(3) 2,421	(3) 0	(3) 0	3,233	0
Canada	5,177	3,939			74,037	60,803			87,746	935
United States	2,223	5,092	525	542	10,394	31,932	4,394	3,800	46,004	6,134
Argentina	6,590	7,770			66,888	30,102			69,975	
Chile					(3) 1	(3) 0	(3) 0	(3) 480	0	483
Uruguay					(1) 1,221	(1) 1,795	(1) 1	(1) 6	2,413	8
India: by sea					(2) 108	(2) 1,934	(2) 355	(2) 2,347	1,984	4,421
: by land					(4) 173	(4) 179	(4) 39	(4) 56	443	132
Iran					(2) 0	(2) 0	(2) 0	(2) 0	0	0
Manchukuo					(5) 0	(5) 0	(5) 3	(5) 3	0	16
Turkey	38	30			157	1,056			1,098	
Egypt	1	0	0	27	4		29	27	1	60
Australia					(1) 10,940	(1) 19,968	(1) 0	(1) 0	36,429	0
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U.	1	50	1,046	2,196	263	1,845	16,490	15,680	2,219	24,891
Greece					(1) 0	(1) 0	(1) 3,697	(1) 3,360	0	7,740
Netherlands	0	0	2,081	1,540	2	20	9,590	10,356	21	15,623
Portugal					(1) 0	(1) 0	(1) 267	(1) 1,199	0	1,295
Mexico					(4) 0	(4) 0	(4) 13	(4) 113	0	1,243
Brazil							(4) 6,273	(4) 7,529		23,172
Peru					(3) 0	(3) 0	(3) 1,182	(3) 1,141	0	2,625
Burma	0	1		3	6	4	59	54	7	68
Ceylon			0	45			72	88		91
China					(4) 170	(1) 147	(1) 865	(1) 552	511	9,597
Chosen					(1) 14	(1) 0	(1) 39	(1) 71		86
Taiwan							(2) 3	(2) 2		14
Indochina					(2) 0	(2) 0	(2) 1	(2) 2	0	7
Japan							(3) 274	(3) 233		679
British Malaya					(3) 2	(3) 1	(3) 13	(3) 6	4	16
Palestine					(1) 0	(1) 0	(1) 406	(1) 871	0	1,791
Union of South Africa					(3) 0	(3) 0	(3) 103	(3) 1,025	0	1,030
New Zealand					(1) 0	(1) 0	(1) 409	(1) 812	0	2,006
Rye. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Hungary					(2) 271	(2) 175	(2) 0	(2) 0	309	0
Romania	271	46	0	0	1,184	106	0	0	640	0
Yugoslavia					(3) 0	(3) 0	(3) 0	(3) 0	0	0
Canada	0	0			1,657	469			984	0
United States	152	0	0	0	295	374	0	0	374	0
Argentina	878	286			4,360	523			2,064	
Turkey	20	5			50	26			177	
<i>Importing Countries:</i>										
Belgo-Luxemb. U. R.	0	0	87	684	0	21	1,993	4,695	32	6,863
Greece					(1) 0	(1) 0	(1) 0	(1) 0	0	0
Netherlands	0	26	28	156	1	967	232	654	976	1,649
Palestine							(1) 170	(1) 104		188

(1) Up to the end of February. — (2) Up to January 31. — (3) Up to December 31. — (4) Up to November 30. — (5) Up to October 31.

COUNTRIES	MARCH				EIGHT MONTHS (August 1-March 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Wheat Flour. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Hungary	...	...	...	...	(1) 1,241	(1) 497	(1) 0	(1) 0	1,027	0
Romania	...	...	...	...	(1) 1	(1) 2	(1) 0	(1) 0	2	0
Yugoslavia	...	...	...	...	(2) 17	(2) 20	(2) 0	(2) 0	32	0
Canada	1,403	707	...	...	9,243	5,897	...	...	9,024	145
United States	1,261	1,084	0	1	8,827	7,922	95	106	14,059	159
Argentina	237	170	...	...	1,462	1,291	...	...	2,049	...
Uruguay	...	...	...	...	(1) 237	(1) 205	(1) 0	(1) 0	408	0
Chosen	...	...	...	...	(1) 134	(1) 341	(1) 0	(1) 0	523	0
India: by sea	...	...	...	...	(2) 699	(2) 724	(2) 2	(2) 1	1,172	4
Iran	...	...	...	...	(2) 0	(2) 0	(2) 0	(2) 0	0	0
Japan	...	...	...	...	(3) 2,721	(3) 2,749	(3) 60	(3) 0	4,594	0
Turkey	0	7	...	...	1	52	...	...	75	...
Australia	...	...	...	...	(1) 7,562	(1) 7,614	(1) 0	(1) 0	14,767	0
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U.	2	6	0	2	21	52	63	14	95	40
Greece	...	...	...	...	(1) 0	(1) 0	(1) 23	(1) 21	0	43
Netherlands	0	0	142	189	4	3	1,295	1,083	5	1,829
Portugal	...	...	...	...	(1) 0	(1) 0	(1) 10	(1) 28	0	38
Haiti	...	...	...	...	(2) 113	(2) 113	(2) 103	(2) 103	...	177
Mexico	...	...	...	...	(4) 0	(4) 0	(4) 1	(4) 1	0	2
Brazil	...	...	...	...	...	...	(4) 261	(4) 372	...	798
Chile	...	...	...	...	(3) 0	(3) 0	(3) 33	(3) 43	2	93
Peru	...	...	...	...	(3) 0	(3) 0	(3) 19	(3) 18	0	42
Burma	0	0	50	30	1	1	504	436	1	865
Ceylon	...	...	5	37	...	...	302	256	...	366
China	...	...	...	...	(1) 732	(1) 264	(1) 3,502	(1) 2,796	1,176	7,108
Formosa	...	...	...	...	(2) 3	(2) 1	(2) 0	(2) 0	8	0
Netherlands Indies:	...	...	...	...	...	...	...	...	...	...
Java and Madura	...	...	...	...	...	...	(2) 745	(2) 660	...	1,271
Outer Provinces	...	...	...	...	...	...	(2) 503	(2) 383	...	746
Indochina	...	...	...	...	(2) 0	(2) 0	(2) 140	(2) 302	4	719
British Malaya	...	...	...	...	(3) 68	(3) 59	(3) 756	(3) 618	134	1,535
Manchukuo	...	...	...	...	(5) 0	(5) 0	(5) 3,127	(5) 1,730	0	5,592
Palestine	...	...	...	...	(1) 0	(1) 0	(1) 345	(1) 262	0	415
Egypt	0	0	2	8	1	1	34	34	0	46
Union of South Africa	...	...	...	...	(3) 4	(3) 1	(3) 5	(3) 4	2	9
New Zealand	...	...	...	...	(1) 0	(1) 0	(1) 0	(1) 0	0	1
Barley. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Hungary	...	...	...	...	(2) 138	(2) 59	(2) 0	(2) 0	107	0
Romania	0	98	0	0	2,329	2,618	0	0	4,195	0
Yugoslavia	...	...	...	...	(3) 3	(3) 0	(3) 0	(3) 8	1	21
Canada	132	243	...	...	5,592	6,156	...	...	7,919	1
United States	68	207	17	0	1,531	4,530	158	1	5,101	237
Argentina	2,166	1,381	...	...	7,477	2,799	...	...	4,644	...
Chile	...	...	...	...	(3) 217	(3) 310	...	...	1,076	...
India: by sea	...	...	...	...	(2) 7	(2) 35	(2) 205	(2) 26	39	79
Iran	...	...	...	...	(2) 83	(2) 33	(2) 0	(2) 0	97	0
Manchukuo	...	...	...	...	(5) 0	(5) 0	...	...	5	...
Turkey	239	102	...	...	750	1,941	...	...	2,740	...
Egypt	0	0	0	2	1	68	0	15	68	19
Union of South Africa	...	...	...	...	(3) 0	(3) 0	(3) 0	(3) 0	1	0
Australia	...	...	...	...	(1) 275	(1) 720	(1) 0	(1) 0	1,545	0
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U.	0	9	614	898	8	180	4,423	7,990	217	10,406
Greece	...	...	...	...	(1) 0	(1) 0	(1) 54	(1) 314	0	344
Netherlands	79	44	79	318	81	810	1,198	3,244	848	4,855
Mexico	...	...	...	...	(4) 0	(4) 0	(4) 32	(4) 50	0	146
Burma	...	...	1	0	...	...	4	3	...	4
Ceylon	...	...	...	1	...	...	7	8	...	11
Chosen	...	...	...	...	(1) 1	(1) 0	(1) 0	(1) 0	0	2
Indochina	...	...	...	...	(2) 0	(2) 0	(2) 0	(2) 0	0	1
Japan	...	...	...	...	...	...	(3) 0	(3) 0	...	0
Palestine	...	...	...	...	(1) 0	(1) 6	(1) 26	(1) 199	6	304
New Zealand	...	...	...	...	(1) 0	(1) 0	(1) 71	(1) 40	0	216

(1) Up to the end of February. — (2) Up to January 31. — (3) Up to December 31. — (4) Up to November 30. — (5) Up to October 31.

COUNTRIES	MARCH				EIGHT MONTHS (August 1-March 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Oats. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Hungary . . . . .	...	...	...	...	(2) 0	(2) 0	(2) 0	(2) 0	0	0
Romania	0	0	0	0	0	0	0	0	0	0
Yugoslavia . . . . .	...	...	...	...	(3) 0	(3) 0	(3) 0	(3) 0	0	0
Canada	406	210	...	...	3,343	2,054	...	...	3,265	1,134
United States	16	4	333	29	52	1,100	1,672	58	1,114	427
Argentina	702	1,099	—	—	6,860	4,125	—	—	5,957	—
Chile . . . . .	...	...	...	...	(3) 288	(3) 287	(3) 0	(3) 0	1,119	0
Chosen . . . . .	...	...	...	...	(1) 0	(1) 1	(1) 0	(1) 0	1	0
India : by sea . . . . .	...	...	...	...	(2) 7	(2) 12	—	—	21	—
Turkey	0	9	—	—	6	143	—	—	231	—
Union of South Africa . . . . .	...	...	...	...	(3) 4	(3) 2	(3) 0	(3) 0	5	2
Australia . . . . .	...	...	...	...	(1) 50	(1) 20	(1) 0	(1) 0	41	3
New Zealand . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 13	(1) 2	4	5
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U.	0	0	12	97	0	1	77	345	1	655
Greece . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 165	(1) 0	0	0
Netherlands	2	59	53	95	2	324	623	556	379	1,221
Mexico . . . . .	...	...	...	...	(4) 0	(4) 0	(4) 3	(4) 20	0	25
Peru . . . . .	...	...	...	...	...	...	(3) 10	(3) 11	—	26
Ceylon . . . . .	...	...	0	2	...	...	9	11	—	17
Indochina . . . . .	...	...	...	...	(2) 0	(2) 0	(2) 0	(2) 0	0	0
Egypt . . . . .	...	...	0	0	—	—	0	0	—	1
Maize. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
				FIVE MONTHS (November 1-March 31)				TWELVE MONTHS (Nov. 1-Oct. 31)		
Hungary . . . . .	...	...	...	...	(2) 0	(2) 136	(2) 58	(2) 0	1,038	0
Romania	1,398	1,052	0	0	4,872	6,104	...	...	12,014	0
Yugoslavia . . . . .	...	...	...	...	(3) 2	(3) 289	(3) 0	(3) 0	2,334	0
United States	1,025	2,099	22	19	10,812	13,067	138	92	19,783	253
Haiti . . . . .	...	...	...	...	(1) 2	(1) 1	—	—	8	—
Dominican Republic . . . . .	...	...	...	...	(1) 80	(1) 140	—	—	340	—
Argentina	4,202	2,282	—	—	21,050	21,599	—	—	74,809	—
Brazil . . . . .	...	...	...	...	(4) 69	(4) 126	—	—	1,658	—
Burma	25	5	—	—	44	39	—	—	397	—
China . . . . .	...	...	...	...	(1) 0	(1) 26	—	—	26	—
India : by sea . . . . .	...	...	...	...	(2) 0	(2) 1	—	—	1	—
Netherlands Indies : Java and Madura . . . . .	...	...	...	...	(1) 238	(1) 563	—	—	1,353	—
Outer Provinces . . . . .	...	...	...	...	(2) 29	(2) 80	—	—	813	—
Indochina . . . . .	...	...	...	...	(2) 2,821	(2) 3,268	—	—	10,037	—
Manchukuo . . . . .	...	...	...	...	...	...	—	—	6,416	—
Egypt	1	0	0	0	2	2	0	0	2	1
Union of South Africa	607	453	...	...	5,843	2,408	(3) 0	(3) 4	12,752	10
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U.	0	62	609	892	0	179	4,268	5,243	345	12,188
Greece . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 151	(1) 466	0	1,336
Netherlands	0	0	1,463	1,497	0	0	6,933	7,440	2	15,951
Portugal . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 123	(1) 354	0	864
Mexico . . . . .	...	...	...	...	(4) 0	(4) 0	(4) 151	(4) 0	0	807
Peru . . . . .	...	...	...	...	(3) 0	(3) 0	(3) 0	(3) 0	0	0
Chosen . . . . .	...	...	...	...	(1) 0	(1) 7	(1) 74	(1) 0	118	488
Japan . . . . .	...	...	...	...	—	—	(3) 1,128	(3) 950	—	6,479
Palestine . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 37	(1) 45	0	160
Australia . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 11	(1) 0	0	0
New Zealand . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 17	(1) 0	0	56

(1) Up to the end of February — (2) Up to January 31. — (3) Up to December 31. — (4) Up to November 30.

COUNTRIES	MARCH				THREE MONTHS (January 1-March 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1940	1939	1940	1939	1939	1939
Rice. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
United States . . .	294	314	41	69	863	928	86	158	3,093	711
Mexico . . .	...	...	...	...	...	...	...	...	(3) 49	(3) 0
Brazil . . .	...	...	...	...	...	...	...	...	(3) 1,231	...
Burma . . .	8,390	11,334	2	2	19,456	25,504	5	7	75,481	26
Chosen . . .	...	...	...	...	...	...	...	...	2,220	0
Taiwan . . .	...	...	...	...	(2) 7	(2) 4	(2) 0	(2) 0	296	0
Indochina . . .	...	...	...	...	(2) 5,479	(2) 1,778	(2) 3	(2) 24	35,273	197
Iran . . .	...	...	...	...	(2) 0	(2) 0	(2) 1	(2) 1	0	18
Thailand (Siam) . . .	...	...	...	...	(2) 6,210	(2) 6,173	...	...	41,010	...
Egypt . . .	374	252	0	0	(2) 1,287	(2) 885	0	1	2,579	2
Australia . . .	...	...	...	...	(1) 46	(1) 40	(1) 4	(1) 8	325	45
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U. . .	0	43	39	142	1	114	535	344	365	1,780
Greece . . .	...	...	...	...	(1) 0	(1) 0	(1) 172	(1) 122	0	647
Hungary . . .	...	...	...	...	(2) 0	(2) 0	(2) 90	(2) 65	0	584
Netherlands . . .	1	179	120	345	2	403	237	605	1,608	5,160
Portugal . . .	...	...	...	...	(1) 0	(1) 0	(1) 5	(1) 4	0	104
Romania . . .	...	...	37	56	...	...	138	118	...	360
Yugoslavia . . .	...	...	...	...	...	...	...	...	0	394
Haiti . . .	...	...	...	...	...	...	(1) 1	(1) 1	...	11
Argentina . . .	...	...	...	...	(1) 0	(1) 1	(1) 17	(1) 125	2	679
Chile . . .	...	...	...	...	...	...	...	...	...	187
Peru . . .	...	...	...	...	...	...	...	...	2	463
Ceylon . . .	0	0	1,024	1,386	1	0	3,615	3,691	3	13,391
China . . .	...	...	...	...	(1) 3	(1) 82	(1) 2,188	(1) 768	156	7,060
India: by sea . . .	...	...	...	...	(2) 386	(2) 407	(2) 3,187	(2) 2,670	6,343	51,294
" by land . . .	...	...	...	...	...	...	...	...	(3) 392	(3) 1,543
Netherlands Indies:	...	...	...	...	...	...	...	...	...	...
Java and Madura . . .	...	...	...	...	(1) 32	(1) 11	(2) 60	(2) 0	258	729
Outer Provinces . . .	...	...	...	...	(2) 0	(2) 17	(2) 137	(2) 408	214	5,372
Japan . . .	...	...	...	...	...	...	...	...	444	965
British Malaya . . .	...	...	...	...	...	...	...	...	3,723	19,640
Manchukuo . . .	...	...	...	...	...	...	...	...	(4) 8	(4) 1,681
Palestine . . .	...	...	...	...	(1) 7	(1) 23	(1) 81	(1) 85	85	562
Union of South Afr. . .	...	...	...	...	...	...	...	...	0	1,731
New Zealand . . .	...	...	...	...	(1) 0	(1) 0	(1) 14	(1) 14	0	41
Linseed. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Romania . . .	0	1	0	2	0	1	0	2	3	2
Argentina . . .	2,806	3,875	...	...	9,224	11,089	...	...	26,082	...
Uruguay . . .	...	...	...	...	(1) 442	(1) 345	...	...	2,403	...
China . . .	...	...	...	...	(1) 0	(1) 6	...	...	99	...
India: by sea . . .	...	...	...	...	(2) 206	(2) 510	(2) 0	(2) 0	5,934	...
" by land . . .	...	...	...	...	...	...	...	...	...	...
Manchukuo . . .	...	...	...	...	...	...	...	...	67	...
Egypt . . .	6	0	0	0	6	0	0	0	2	1
New Zealand . . .	...	...	...	...	(1) 1	(1) 1	(1) 0	(1) 0	2	0
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U. . .	19	34	128	189	23	58	453	1,024	97	2,349
Greece . . .	...	...	...	...	(1) 0	(1) 0	(1) 7	(1) 7	0	71
Hungary . . .	...	...	...	...	(2) 0	(2) 0	(2) 2	(2) 0	0	34
Netherlands . . .	84	50	550	369	171	105	1,043	1,950	142	6,833
Yugoslavia . . .	...	...	...	...	...	...	...	...	0	159
Canada . . .	...	...	...	...	(1) 6	(1) 5	...	...	10	(5) 335
United States . . .	...	...	1,104	1,138	...	...	2,684	3,579	...	8,976
Burma . . .	0	0	0	0	0	0	0	0	0	0
Japan . . .	...	...	...	...	...	...	...	...	0	52
Palestine . . .	...	...	...	...	...	...	...	...	...	24
Australia . . .	...	...	...	...	(1) 0	(1) 0	(1) 97	(1) 36	0	621

(1) Up to the end of February. — (2) Up to January 31. — (3) Up to November 30. — (4) Up to October 31. — (5) Up to July 31.

COUNTRIES	MARCH				EIGHT MONTHS (August 1-March 31)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Cotton. — Thousand cents (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
United States . . .	2,290	1,732	48	48	28,277	14,719	560	477	17,562	749
Haiti . . .	...	...	...	...	(1) 12	(1) 20	...	...	104	...
Mexico . . .	...	...	...	...	(4) 32	(4) 170	(4) 6	(4) 2	308	9
Dominican Republic . . .	...	...	...	...	(1) 0	(1) 2	...	...	5	...
Argentina . . .	32	2	...	...	329	349	...	...	555	...
Brazil . . .	...	...	...	...	(4) 1,791	(4) 2,057	...	...	7,692	...
Peru . . .	...	...	...	...	(3) 883	(3) 982	...	...	1,801	...
Burma . . .	23	35	0	0	285	267	0	0	385	0
China . . .	...	...	...	...	(1) 71	(1) 1,235	(1) 2,638	(1) 594	1,305	3,698
India: by sea . . .	...	...	...	...	(2) 4,350	(2) 5,018	(2) 912	(2) 724	12,898	1,685
N. I.: Java & Mad. . .	...	...	...	...	(1) 2	(1) 8	...	...	17	...
Outer provinces . . .	...	...	...	...	(2) 17	(2) 10	...	...	19	...
Iran . . .	...	...	...	...	(2) 152	(2) 63	(2) 0	(2) 0	223	0
Turkey . . .	22	22	...	...	87	286	...	...	385	...
Egypt . . .	867	867	...	...	6,069	5,714	...	...	8,429	...
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U. . .	0	78	239	218	109	559	1,560	1,636	906	2,335
Greece . . .	...	...	...	...	(1) 0	(1) 0	(1) 31	(1) 22	0	49
Hungary . . .	...	...	...	...	(2) 0	(2) 0	(2) 296	(2) 330	0	629
Netherlands . . .	0	1	203	118	2	10	1,147	825	12	1,203
Portugal . . .	...	...	...	...	...	...	(1) 277	(1) 326	...	474
Romania . . .	...	0	67	27	0	0	238	310	0	433
Yugoslavia . . .	...	...	...	...	(3) 0	(3) 0	(3) 147	(3) 246	0	515
Ceylon . . .	0	0	2	2	0	0	19	12	...	1,269
Chosen . . .	...	...	...	...	(1) 0	(1) 0	(1) 177	(1) 216	0	17
Indochina . . .	...	...	...	...	(2) 3	(2) 3	(2) 95	(2) 378	5	601
Japan . . .	...	...	...	...	(3) 0	(3) 1	(3) 5,749	(3) 5,573	1	13,176
Manchukuo . . .	...	...	...	...	(5) 0	(5) 0	(5) 67	(5) 308	0	682
Palestine . . .	...	...	...	...	(1) 1	(1) 0	(1) 12	(1) 8	0	16
Union of South Afr . . .	...	...	...	...	(3) 0	(3) 3	(3) 7	(3) 6	3	13
Australia . . .	...	...	...	...	(1) 0	(1) 0	(1) 99	(1) 82	0	121
Wool. — Thousand lb.										
<i>Exporting Countries:</i>					SEVEN MONTHS (September 1-March 31)				TWELVE MONTHS (Sept 1-Oct 31)	
Argentina { (a) 24,456 31,015 — — 140,468 196,025 — — 299,633 —	(b) 7,516 5,348 — — 44,326 33,043 — — 56,747 —									
Chile . . .	...	...	...	...	(3) 351 (3) 5,556 (3) 73 (3) 302				30,838	461
Peru . . .	...	...	...	...	(3) 5,035 (3) 3,635 — — 12,022 —				95,932 —	
Uruguay . . . { (a) 44,441 (4) 45,310 — — 11,984 (1) 9,718 — — 24,306 —	(b) 150 170 — — 150 170 — — 311 —								0	
Burma . . .	33 40 0 0				(1) 465 (1) 4,678 — — 6,671 —				6,671 —	
China . . .	...	...	...	...	(2) 28,127 (2) 34,683 (2) 2,088 (2) 2,771				76,997 —	
India: by sea . . .	...	...	...	...	— — (4) 5,093 (4) 4,068 — — 6,151 —				20,097 —	
Iran . . .	...	...	...	...	(2) 6,310 (2) 1,475 (2) 0 (2) 0				0 —	
Manchukuo . . .	...	...	...	...	(5) 104 (5) 498 (5) 93 (5) 0				3,567 —	
Palestine . . .	...	...	...	...	(1) 46 (1) 60 (1) 9 (1) 15				181 —	
Turkey . . . (a) 571 1,477 — — 5,337 11,918 — — 21,272 —	(b) 489 390 46 24 2,262 2,934 256 229								5,176 —	
Egypt . . .	19,235 20,250 — — 116,072 183,785 (3) 75 (3) 747								234,846 —	
Un. of S. Africa. { (a) 1,512 963 — — 6,041 4,449 (3) 437 (3) 509	(b) 1,512 963 — — 6,041 4,449 (3) 437 (3) 509								7,994 —	
Australia . . . { (a) 434,583 (1) 515,328 (1) 1,133 (1) 6,984	(b) 23,574 (1) 33,634 (1) 86 (1) 161								799,315 —	
New Zealand . . . { (a) 79,563 (1) 108,051 (1) 73 (1) 46	(b) 4,504 (1) 17,566 (1) 0 (1) 4								66,604 —	
<i>Importing Countries:</i>										
Belgo-Luxemb. { (a) 0 2,220 5,042 20,516 5,895 29,452 17,337 132,040 57,574 220,450	(b) 337 2,434 141 653 11,565 17,937 1,521 3,186 32,851 7,496									
Greece . . .	...	...	...	...	(1) 304 (1) 719 (1) 1,455 (1) 2,760				2,103 —	
Hungary . . .	...	...	...	...	(2) 0 (2) 280 (2) 670 (2) 1,177				1,027 —	
Netherlands . . . { (a) 40 313 1,517 1,140 364 924 11,045 5,494 3,166 11,572	(b) 11 22 864 926 49 168 8,056 6,294 756 12,225									
Portugal . . .	...	...	...	...	(1) 2,035 (1) 620 (1) 785 (1) 1,761				2,251 —	
Romania . . .	0 0 7 53 0 18 84 631								62 —	
Yugoslavia . . .	...	...	...	...	(3) 0 (3) 220 (3) 1,082 (3) 4,394				353 —	
United States . . .	26 2 38,530 25,441 110 267 219,226 128,770 417 209,676								139 —	
Mexico . . .	...	...	...	...	(4) 0 (4) 267 (4) 1,344 (4) 1,008				0 —	
Japan . . .	...	...	...	...	(3) 0 (3) 0 (3) 26,469 (3) 29,716				107,551 —	

(a) Unwashed wool. — (b) Washed wool. — (1) Up to the end of February. — (2) Up to January 31. — (3) Up to December 31. — (4) Up to November 30. — (5) Up to October 31.

COUNTRIES	MARCH				THREE MONTHS (January 1-March 31)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1940	1939	1940	1939	1939	1939

Butter. — Thousand lb.

Exporting Countries :

Hungary . . . . .	...	...	...	...	(2) 40	(2) 395	(2) 0	(2) 0	3,305	0
Netherlands	8,252	9,877	0	0	25,223	22,719	0	0	124,420	0
Portugal . . . . .	...	...	...	...	(1) 18	(1) 15	(1) 0	(1) 0	157	0
Romania	31	57	0	0	234	108	0	0	955	0
Yugoslavia . . . . .	...	...	...	...	...	...	...	...	260	...
Argentina	798	2,189	...	...	8,594	6,111	...	...	19,745	...
Union of South Afr.	...	...	...	...	...	...	...	...	6,929	24
Australia . . . . .	...	...	...	...	(1) 62,226	(1) 36,685	(1) 0	(1) 0	249,621	4
New Zealand . . . .	...	...	...	...	(1) 57,437	(1) 54,807	(1) 0	(1) 0	274,258	2

Importing Countries :

Belgo-Luxemb. E. U.	558	0	0	291	558	4	0	2,064	26	2,081
Greece . . . . .	—	—	...	...	—	—	(1) 35	(1) 214	—	1,074
United States	262	134	126	119	679	410	295	284	2,308	1,107
Mexico . . . . .	—	—	...	...	—	—	...	...	—	(3) 123
Peru . . . . .	—	—	...	...	—	—	...	...	—	335
Burma	—	—	44	46	—	—	163	181	—	719
Ceylon	—	—	79	75	—	—	220	227	—	1,109
China . . . . .	—	—	...	...	—	—	(1) 93	(1) 77	—	593
India: by sea . . . .	—	—	...	...	(2) 562	(2) 509	(2) 99	(2) 110	5,785	1,065
" by land . . . .	—	—	...	...	—	—	...	...	—	(3) 4,846
Netherlands Indies:	—	—	...	...	—	—	...	...	—	...
Java and Madura	—	—	...	...	—	—	(2) 626	(2) 397	—	6,698
Outer Provinces	—	—	...	...	—	—	(2) 214	(2) 159	—	2,588
Indochina . . . . .	—	—	...	...	(2) 0	(2) 0	(2) 117	(2) 705	—	4
Iran . . . . .	—	—	...	...	(2) 0	(2) 0	(2) 7	(2) 20	—	185
British Malaya . . . .	—	—	...	...	—	—	...	...	657	5,161
Palestine . . . . .	—	—	...	...	(1) 0	(1) 0	(1) 791	(1) 888	2	4,389
Egypt	0	26	148	84	22	123	300	207	265	871

Cheese. — Thousand lb.

Exporting Countries :

Hungary . . . . .	...	...	...	...	(2) 4	(2) 7	(2) 2	(2) 0	741	2
Netherlands	10,192	10,688	42	71	28,757	28,431	132	161	114,531	615
Romania	55	40	0	11	86	57	15	22	392	57
Yugoslavia . . . . .	...	...	...	...	...	...	...	...	3,803	40
Argentina	273	384	—	—	977	1,047	—	—	5,474	84
Union of South Afr.	...	...	...	...	...	...	...	...	4,253	282
Australia . . . . .	...	...	...	...	(1) 10,095	(1) 7,646	(1) 22	(1) 31	39,796	121
New Zealand . . . .	...	...	...	...	(1) 43,969	(1) 36,597	(1) 0	(1) 2	187,166	2

Importing Countries :

Belgo-Luxemb. E. U.	15	20	3,516	4,211	46	53	10,459	12,392	236	52,007
Greece . . . . .	...	...	...	...	(1) 18	(1) 4	(1) 22	(1) 536	95	2,198
Portugal . . . . .	...	...	...	...	(1) 37	(1) 42	(1) 7	(1) 18	216	201
United States	183	132	3,697	4,881	461	337	9,994	13,221	1,479	59,075
Mexico . . . . .	...	...	...	...	...	...	...	...	(3) 7	(3) 838
Chile . . . . .	...	...	...	...	...	...	...	...	9	97
Peru . . . . .	...	...	...	...	...	...	...	...	2	721
Burma	—	—	9	11	—	—	24	33	—	97
Ceylon	—	—	13	24	—	—	66	44	—	194
India: by sea . . . .	—	—	...	...	(2) 0	(2) 0	(2) 185	(2) 101	4	992
Netherlands Indies:	—	—	...	...	—	—	...	...	—	...
Java and Madura	—	—	...	...	—	—	(2) 123	(2) 97	—	2,011
Indochina . . . . .	...	...	...	...	(2) 0	(2) 0	(2) 62	(2) 40	—	520
British Malaya . . . .	...	...	...	...	...	...	...	...	33	419
Palestine . . . . .	...	...	...	...	(1) 2	(1) 2	(1) 141	(1) 377	20	2,077
Egypt	4	7	313	494	11	26	1,270	1,270	64	5,315

(1) Up to the end of February. — (2) Up to January 31. — (3) Up to November 30.

COUNTRIES	MARCH				SIX MONTHS (October 1-March 31)				TWELVE MONTHS (Oct. 1 Sept. 30)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Cacao. — Thousand lb.										
<i>Exporting Countries:</i>										
Haiti	...	...	—	—	(1) 1,682	(1) 2,811	—	—	3,979	—
Dominican Republic	...	...	—	—	(1) 12,452	(1) 18,140	—	—	63,690	—
Brazil	...	...	—	—	(4) 53,548	(4) 50,546	—	—	303,317	—
Equador	...	...	—	—	(2) 4,896	(2) 9,385	—	—	36,174	—
Trinidad	...	...	—	—	(3) 3,001	(3) 4,156	—	—	17,921	—
Ceylon	791	754	—	—	6,638	4,372	—	—	7,754	—
Java and Madura	...	...	—	—	(1) 1,003	(1) 1,689	—	—	3,098	—
Belgian Congo	...	...	—	—	(2) 818	(2) 1,041	—	—	2,806	—
Gold Coast	43,799	86,514	—	—	259,948	438,554	—	—	643,415	—
Nigeria & Cameroom	...	...	—	—	(1) 70,566	(1) 146,817	—	—	259,104	—
São Thomé and Príncipe Islands	...	...	—	—	(3) 5,833	(3) 8,830	—	—	23,202	—
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U.	0	0	1,601	2,690	0	0	15,492	13,433	168	26,678
Greece	...	...	...	...	(1) 2	(1) 0	(1) 664	(1) 1,792	0	4,101
Hungary	...	...	...	...	...	...	(2) 1,116	(2) 3,942	...	13,045
Netherlands	1,100	49	9,372	21,508	1,100	1,149	65,835	92,464	1,537	180,200
Portugal	...	...	...	...	(1) 2	(1) 0	(1) 672	(1) 560	2	1,215
Romania	...	...	165	223	...	...	1,400	2,355	...	3,783
Yugoslavia	...	...	...	...	...	...	(3) 430	(3) 840	...	3,157
United States	...	...	33,299	98,097	...	...	316,620	296,734	...	583,184
Argentina	...	...	...	...	...	...	(1) 4,301	(1) 3,982	...	10,966
Uruguay	...	...	...	...	...	...	(2) 522	(2) 509	...	1,334
Palestine	...	...	...	...	...	...	(1) 406	(1) 348	...	1,451
Egypt	...	...	183	60	...	...	1,052	582	...	639
Union of South Africa	...	...	...	...	...	...	(3) 518	(3) 635	...	2,377
Australia	...	...	...	...	(1) 0	(1) 0	(1) 9,127	(1) 5,470	11	14,919
New Zealand	...	...	...	...	...	...	(1) 2,976	(1) 1,451	...	4,191
Coffee. — Thousand lb.										
NINE MONTHS (July 1-March 31)										
<i>Exporting Countries:</i>									TWELVE MONTHS (July 1-June 30)	
Costa Rica	...	...	...	...	(1) 18,726	(1) 30,572	...	...	45,429	...
Guatemala	14,143	11,709	...	...	63,359	68,220	...	...	86,988	...
Haiti	...	...	...	...	(1) 33,100	(1) 38,951	...	...	64,854	...
Jamaica	622	483	...	...	4,354	6,047	...	...	8,808	...
Mexico	...	...	...	...	(4) 13,369	(4) 11,359	...	...	79,766	...
Nicaragua	...	...	...	...	(1) 14,842	(1) 12,668	...	...	40,305	...
Dominican Republic	...	...	...	...	(1) 12,516	(1) 14,094	...	...	30,459	...
Salvador	...	...	...	...	(1) 53,769	(1) 68,531	...	...	130,792	...
Brazil	149,035	165,330	...	...	1,611,212	1,587,107	...	...	2,155,720	...
Colombia	38,041	38,969	...	...	357,787	396,214	...	...	537,319	...
Equador	...	...	...	...	(1) 24,723	(1) 24,899	...	...	31,326	...
Netherlands Guyana	...	...	...	...	(3) 3,351	(3) 3,272	...	...	5,404	...
Peru	...	...	...	...	(3) 4,658	(3) 3,812	(3) 0	(3) 2	6,546	4
Venezuela	7,829	10,137	...	...	31,348	51,176	...	...	69,737	...
Aden: by sea	...	...	...	...	(1) 8,358	(1) 7,319	...	...	11,380	...
India: by sea	...	...	...	...	(2) 5,966	(2) 6,169	(2) 0	(2) 0	23,155	7
N. I. Java & Mad.	...	...	...	...	(1) 42,534	(1) 38,358	...	...	55,202	...
Outer Provinces	...	...	...	...	(2) 50,969	(2) 73,363	...	...	106,993	...
Indochina	...	...	...	...	(2) 1,259	(2) 635	(2) 31	(2) 57	1,459	106
Belgian Congo	...	...	...	...	(2) 20,192	(2) 23,909	...	...	45,285	...
Kenia	...	...	...	...	(3) 13,274	(3) 14,220	...	...	38,142	...
Uganda	...	...	...	...	(3) 21,385	(3) 17,472	...	...	35,084	...
Tanganyika	...	...	...	...	(3) 27,005	(3) 19,659	...	...	30,622	...
<i>Importing Countries:</i>										
Belgo-Luxemb. E. U.	18	35	12,606	9,947	284	3,785	89,962	84,916	4,017	118,027
Greece	...	...	...	...	...	...	(1) 6,931	(1) 9,304	...	13,018
Hungary	...	...	...	...	...	...	(2) 2,180	(2) 2,610	...	5,390
Netherlands	0	1,179	3,058	8,915	4,032	11,526	64,688	88,276	16,339	113,585
Portugal	...	...	...	...	(1) 2,211	(1) 1,091	(1) 11,572	(1) 8,322	1,903	13,716
Romania	...	...	703	1,056	...	...	4,374	6,184	...	8,025
Yugoslavia	...	...	...	...	...	...	(3) 7,862	(3) 7,884	0	15,839
United States	988	1,248	190,476	197,581	9,577	7,361	1,536,861	1,502,372	10,598	1,965,955
Argentina	...	...	...	...	...	...	(1) 40,096	(1) 35,222	...	50,892
Chile	...	...	...	...	...	...	(3) 6,334	(3) 3,521	...	6,967
Uruguay	...	...	...	...	...	...	(1) 3,338	(1) 3,752	...	5,540
Burma	194	57	251	22	1,060	88	423	231	269	302
Ceylon	0	0	57	247	7	0	2,363	2,456	2	3,170
Japan	...	...	...	...	(3) 20	(3) 247	(1) 1,175	(3) 4,458	326	6,279
British Malaya	...	...	...	...	(3) 5,170	(3) 3,168	(3) 12,189	(3) 9,462	7,297	21,030
Palestine	...	...	...	...	(1) 4	(1) 0	(1) 2,709	(1) 1,845	0	3,624
Turkey	...	...	2,416	897	...	...	10,924	8,755	...	12,260
Egypt	...	...	1,098	917	...	...	11,797	8,600	...	12,081
Union of South Afr.	...	...	...	...	(3) 90	(3) 11	(3) 23,764	(3) 18,583	24	33,193
Australia	...	...	...	...	(1) 90	(1) 75	(1) 3,649	(1) 2,083	108	4,506
New Zealand	...	...	...	...	0	(1) 0	(1) 306	(1) 351	0	569

(1) Up to the end of February. — (2) Up to January 31. — (3) Up to December 31. — (4) Up to November 30.

COUNTRIES	MARCH				NINE MONTHS (July 1-March 31)				TWELVE MONTHS (July 1-June 30)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Tea. — Thousand lb.										
Exporting Countries:	15,305	18,435	0	0	155,739	159,611	0	0	231,627	0
Ceylon	...	...	...	...	(1) 49,849	(1) 71,137	(1) 10,029	(1) 2,668	83,388	7,015
China	...	...	...	...	(2) 12,833	(2) 17,628	0	(2) 0	20,435	0
Taiwan	...	...	...	...	(2) 284,565	(2) 286,895	(2) 950	(2) 2,604	332,857	4,722
India: by sea	...	...	...	...	(4) 4,151	(4) 5,611	...	...	13,728	...
: by land	...	...	...	...	(1) 83,000	(1) 82,074	(2) 260	(2) 335	127,258	483
N I: Java & Mad.	...	...	...	...	(2) 17,946	(2) 18,609	...	...	32,428	...
Outer Provinces	...	...	...	...	(2) 4,281	(2) 3,051	(2) 331	(2) 710	4,738	944
Indochina	...	...	...	...	(3) 34,491	(3) 23,129	(3) 73	(3) 86	35,023	130
Japan	...	...	...	...	...	...	...	...	...	...
Importing Countries:	0	0	51	57	7	2	545	478	2	664
Belgo-Luxemb. E.U.	...	...	...	...	...	...	(1) 214	(1) 320	...	414
Greece	...	...	...	...	...	...	(2) 181	(2) 368	...	677
Hungary	...	...	...	...	...	...	...	...	...	...
Netherlands	18	22	2,425	2,610	117	150	26,464	22,172	201	30,448
Portugal	...	...	...	...	...	...	(1) 216	(1) 209	...	317
Romania	...	...	51	93	...	...	595	642	...	800
Yugoslavia	...	...	...	...	...	...	(3) 172	(3) 289	...	485
United States	...	...	8,056	8,576	...	...	80,013	67,224	...	89,601
Argentina	...	...	...	...	...	...	(1) 3,660	(1) 3,269	...	4,802
Chile	...	...	...	...	...	...	(3) 2,518	(3) 3,170	...	6,792
Peru	...	...	...	...	...	...	(3) 503	(3) 595	...	1,074
Uruguay	...	...	...	...	...	...	(1) 320	(1) 342	...	450
Burma	37	4	7	247	617	132	1,651	1,455	163	2,255
Iran	...	...	...	...	(2) 0	(2) 0	(2) 8,940	(2) 10,091	0	17,785
British Malaya	...	...	...	...	(3) 666	(3) 664	(3) 2,624	(3) 2,661	1,495	5,060
Mandchukuo	...	...	...	...	...	...	(5) 8,649	(5) 7,842	...	17,655
Palestine	...	...	...	...	(1) 11	(1) 0	(1) 503	(1) 388	0	675
Turkey	...	...	0	245	...	...	1,030	1,614	...	2,174
Egypt	...	...	1,642	1,373	...	...	12,414	12,480	...	16,535
Union of South Afr.	...	...	...	...	(3) 278	(3) 227	(3) 10,646	(3) 8,655	659	16,865
Australia	...	...	...	...	(1) 368	(1) 331	(1) 37,263	(1) 32,651	461	48,628
New Zealand	...	...	...	...	(1) 88	(1) 86	(1) 8,510	(1) 7,868	165	11,407
Total Wheat and Flour †. — Thousand cents (1 cental = 100 lb.).										
COUNTRIES	MARCH		EIGHT MONTHS (August 31-March 31)		TWELVE MONTHS (August 1-July 31)					
	NET EXPORTS (*)	NET IMPORTS (**)	NET EXPORTS (*)	NET IMPORTS (**)	N. EX. (*)	N. IMP. (**)				
Belgo-Luxemb. E. U.	—	1,043	2,140	—	16,283	13,784				
Greece	—	—	—	(1) 3,728	13,388	—				
Hungary	—	—	—	(1) 16,827	10,993	17,685				
Netherlands	—	2,271	1,791	—	11,311	11,725				
Portugal	—	—	—	(1) 280	1,236	—				
Romania	1,419	1,465	—	14,347	18,008	27,574				
Yugoslavia	—	—	—	(3) 3,932	2,447	3,276				
Canada	7,047	4,839	—	86,361	67,863	98,650				
United States	3,379	5,994	—	17,643	38,554	58,402				
Haiti	—	—	—	—	(1) 151	(1) 137				
Mexico	—	—	—	—	(4) 14	(4) 114				
Argentina	6,907	7,997	—	68,837	31,824	72,706				
Brazil	—	—	—	—	(4) 6,621	(4) 8,025				
Chile	—	—	—	—	(3) 26	(3) 294				
Peru	—	—	—	(1) 1,536	(1) 2,061	—				
Uruguay	—	—	—	—	—	2,948				
Burma	—	80	43	—	724	630				
Ceylon	—	7	95	—	475	429				
China	—	—	—	—	(1) 4,388	(1) 3,781				
Chosen	—	—	—	(1) 155	(1) 385	—				
Taiwan	—	—	—	(2) 1	(2) 1	—				
India: by sea	—	—	—	(2) 683	(2) 551	—				
: by land	—	—	—	(4) 134	(4) 123	—				
N I: Java & Mad.	—	—	—	—	(2) 993	(2) 880				
Outer Provinces	—	—	—	—	(2) 670	(2) 510				
Indochina	—	—	—	—	(2) 188	(2) 405				
Iran	—	—	—	—	(2) 0	(2) 0				
Japan	—	—	—	(3) 3,275	(3) 3,432	5,445				
British Malaya	—	—	—	—	(3) 929	(3) 751				
Mandchukuo	—	—	—	—	(5) 4,172	(5) 2,310				
Palestine	—	—	—	—	(1) 866	(1) 1,221				
Turkey	38	39	2	159	1,124	1,198				
Egypt	—	—	38	—	68	71				
Union of South Afr.	—	—	—	—	(3) 105	(3) 1,029				
Australia	—	—	—	(1) 21,023	(1) 30,120	56,118				
New Zealand	—	—	—	—	(1) 409	(1) 812				

(*) Excess of exports over imports. — (**) Excess of imports over exports.

†) Flour reduced to grain on the basis of the coefficient: 1,000 centals of flour = 1,333.333 centals of grain.

(1) Up to the end of February. — (2) Up to January 31. — (3) Up to December 31. — (4) Up to November 30. — (5) Up to October 31.

STOCKS**Total wheat in the United States ⁽¹⁾**

LOCATION	First day of month				
	April 1940	January 1940	October 1939	April 1939	April 1938
	thousand cents				
On farms	94,490	143,391	199,328	113,045	74,791
In interior mills and elevators	48,490	77,308	97,525	54,028	43,082
Commercial wheat in store	63,241	79,705	97,227	49,613	32,656
In merchant mills and elevators ⁽²⁾	51,082	60,101	71,218	43,436	41,362
Stored for others in merchant mills ⁽³⁾	8,437	11,182	6,052	6,549
<i>Total U S wheat as grain . . . ⁽¹⁾</i>	<i>257,303</i>	<i>368,942</i>	<i>476,480</i>	<i>266,174</i>	<i>198,440</i>
Flour (in terms of grain) in merchant mills ⁽⁴⁾	12,163	15,736	12,357	11,683	12,727
<i>Total U S wheat . . . ⁽¹⁾</i>	<i>269,466</i>	<i>384,678</i>	<i>488,837</i>	<i>277,857</i>	<i>211,167</i>
Canadian wheat in store in bond in the U S	13,415	23,270	6,886	1,064	666
Total wheat in the U. S. . . ⁽¹⁾	282,881	407,948	495,723	278,921	211,833

⁽¹⁾ Incomplete data: wheat in transit is not included, wheat-flour only if in mills. — ⁽²⁾ The figures of the partial quarterly census taken by the Bureau of Census (see next table) have been adjusted to allow for stocks in all mills — ⁽³⁾ Not including wheat stored for others

Wheat and wheat-flour held by commercial mills in the United States ⁽¹⁾.

LOCATION	Last day of month				
	March 1940	December 1939	September 1939	March 1939	March 1938
	thousand cents				
Wheat stocks, the property of commercial millers					
Wheat held in mills, and mill-elevators attached to mills	47,353	55,594	65,947	40,526	38,052
Wheat in other elevators ⁽²⁾	10,116	17,280	17,588	9,916	7,903
Wheat in transit to merchant mills and bought to arrive ⁽³⁾	8,684	8,640	10,522	5,129	5,190
<i>Total . . .</i>	<i>66,153</i>	<i>81,514</i>	<i>94,057</i>	<i>55,571</i>	<i>51,145</i>
Wheat-flour in mills and warehouses, and in transit, sold and unsold	7,836	10,124	7,954	7,576	8,137
Wheat stored for others in mills and mill-elevators and in all other positions	7,608	11,574	15,965	7,970	⁽⁴⁾ 6,025
Grand total ⁽⁴⁾ . . .	85,036	107,654	121,465	74,442	⁽⁴⁾ 68,878

⁽¹⁾ Partial census by the Bureau of Census, including mills accounting for over 90% of the total capacity of all commercial mills — ⁽²⁾ In country elevators, in public terminal elevators and in private terminal elevators not attached to mills. — ⁽³⁾ Of the quantities given under this item only about one-third are actually in transit. — ⁽⁴⁾ Including flour in terms of grain. — ⁽⁵⁾ Not including wheat stored for others outside mills and mill-elevators attached to mills.

Total stocks of home-grown cereals and linseed in Canada on March 31.

PRODUCTS	1940	1939	1938	1937	1936
	1,000 centals				
Wheat	223,185	120,586	50,136	69,127	148,078
Rye	3,344	2,762	1,115	1,091	3,908
Barley	17,425	17,180	12,354	9,483	15,095
Oats	52,315	49,556	26,497	27,231	52,966
Linseed	559	206	295	497	389

Total stocks of home-grown and foreign wheat in different locations in Canada on March 31

LOCATION ⁽¹⁾	1940	1939	1938	1937	1936
	1,000 centals				
On farms	48,694	36,732	23,388	26,539	28,052
In country and interior terminal elevators, Western division	81,926	30,112	9,843	15,462	44,713
In terminal elevators Lake Superior ⁽²⁾	47,952	24,823	7,886	6,825	26,570
In elevators Pacific Coast ⁽³⁾	10,498	5,647	1,070	4,773	7,528
In Port Churchill elevators	1,497	1,328	7	369	1,369
In elevators Eastern region	22,660	13,127	4,428	8,579	30,169
In flour mills	5,679	4,639	2,702	3,860	5,699
In transit	4,279	4,178	811	2,720	3,978
<i>Total Canadian wheat as grain</i>	<i>223,185</i>	<i>120,586</i>	<i>50,136</i>	<i>69,127</i>	<i>148,078</i>
U. S. grain in store in Canada	487	65	596	0	0
TOTAL WHEAT AS GRAIN IN CANADA	223,672	120,651	50,732	69,127	148,078

⁽¹⁾ Quantities afloat for unloading at Canadian ports are included in stocks in terminal elevators Lake Superior or in elevators Eastern region. — ⁽²⁾ Port William and Port Arthur. — ⁽³⁾ Vancouver, New Westminster, Victoria, Prince Rupert.

Imported cereals in Antwerpen.

PRODUCTS	Last day of month				
	April 1940	March 1940	February 1940	April 1939	April 1938
	thousand centals				
Wheat	1,500	1,345	1,174	674	1,213
Rye	38	102	128	84	15
Barley	130	208	160	67	209
Oats	0	0	0	15	22
Maize	17	67	32	105	34

Commercial cereals in store in Canada and the United States.

PRODUCTS AND LOCATION	Friday or Saturday nearest 1st of month ⁽¹⁾				
	May 1940	April 1940	March 1940	May 1939	May 1938
	thousand cents				
WHEAT:					
Canadian in Canada	170,590	173,035	175,254	80,451	24,617
U.S. in Canada	420	487	487	51	448
U.S. in the United States	63,357	63,241	66,457	44,911	25,915
Canadian in the United States	10,321	13,415	16,665	461	429
TOTAL	244,688	250,178	258,863	125,874	51,409
RYE:					
Canadian in Canada	1,776	1,750	1,644	1,280	687
U.S. in Canada	13	13	13	13	330
U.S. in the United States	5,627	5,677	5,667	4,006	1,471
Canadian in the United States	701	629	506	24	0
TOTAL	8,117	8,069	7,830	5,323	2,488
BARLEY:					
Canadian in Canada	3,983	4,144	3,761	3,350	3,914
U.S. in Canada	0	1	1	0	115
U.S. in the United States	5,200	6,693	7,718	4,260	3,606
Canadian in the United States	587	610	741	0	24
TOTAL	9,770	11,448	12,221	7,610	7,659
OATS:					
Canadian in Canada	3,742	4,035	4,022	3,052	2,788
U.S. in Canada	21	38	46	4	324
U.S. in the United States	1,985	2,412	2,517	3,300	4,975
Canadian in the United States	62	137	250	0	0
TOTAL	5,810	6,622	6,835	6,356	8,087
MAIZE:					
U.S. in Canada	802	396	688	1,249	1,986
Argentine in Canada	0	0	0	15	88
South African in Canada	447	560	651	155	783
Australian in Canada	0	0	0	70	0
U.S. in the United States	19,120	22,234	22,722	21,987	22,794
TOTAL	20,369	23,190	24,061	23,476	25,651

(2) Friday for Canada, Saturday for the United States.

Commercial cereals and oilseeds in store in Argentina.

PRODUCTS AND LOCATION	First day of month				
	May 1940	April 1940	March 1940	May 1939	May 1938
	thousand cents				
Wheat ¹⁾	67,691	¹⁾ 75,532	...	—	40,026
Rye	5,057	5,293	5,212	1,649	213
Barley	5,257	5,930	7,101	2,687	1,766
Oats	3,960	4,758	5,069	4,372	3,209
Maize in the ports	2,573	1,263	2,581	826	193
Maize in other positions	4,271	1,106	1,376	3,551	804
TOTAL	6,844	2,369	3,957	4,377	997
Canaryseed	517	520	513	316	306
Linseed in the ports	4,508	5,024	4,651	5,649	5,193
Linseed in other positions	3,386	3,961	4,454	4,666	5,560
TOTAL	7,894	8,985	9,105	10,315	10,753
Sunflowerseed	607	186	40	409	—

⁽¹⁾ Of which 30,476 thousand cents of 1939-40 crop. — ⁽²⁾ Of which 29,202 thousand cents of 1939-40 crop

Wheat and wheat-flour in the Union of South Africa.

LOCATION	Last day of month				
	March 1940	February 1940	January 1940	March 1939	March 1938
	thousand cents				
Wheat held by millers:					
South African	3,438	3,251	2,315	4,235	3,749
Imported	25	29	37	30	4
Wheat held by co-operatives	716	1,041	1,025	821	364
TOTAL	4,179	4,321	3,377	5,086	4,117
Wheat-flour and boermeal ⁽¹⁾ held by millers	269	284	262	275	253
Grand total ⁽²⁾	4,552	4,716	3,740	5,456	4,454

(1) 140 lb. of wheat flour or 165 lb. of boermeal correspond to 200 lb. of wheat — (2) Including flour in terms of grain.

Cotton stocks on hand in the United States.

LOCATION	Last day of month				
	April 1940	March 1940	February 1940	April 1939	April 1938
	thousand cents				
In consuming establishments	7,225	7,846	8,363	6,352	8,440
In public storage and at compresses	52,841	56,103	59,809	63,814	52,113
TOTAL	60,076	63,948	68,172	70,166	60,553

Cotton stocks at Bombay, Alexandria and Port Sudan.

LOCATION	Thursday nearest 1st of month ⁽¹⁾				
	April 1938	April 1940	February 1940	April 1939	April 1938
	thousand cents				
Bombay ⁽²⁾	4,745	4,167	3,631	4,426	4,260
Alexandria ⁽³⁾	⁽⁴⁾ 2,403	2,645	2,614	2,956	2,715
Port Sudan . . . . .	...	438	246	638	634

⁽¹⁾ Stocks held by exporters, dealers and millers. — ⁽²⁾ Quantities consumed in Alexandria, or returned to the interior of the country, are not included. — ⁽³⁾ For Port Sudan the data refer to the last day of the preceding month — ⁽⁴⁾ Stocks in Alexandria on May 1: 2,181 thousand cents.

AUTHORITIES: East Indian Cotton Assn. and Commission de la Bourse de Moud-el-Basal.

PRICES**PRICES BY PRODUCTS (*)**

All quotations are spot, on Fridays, unless otherwise stated. The monthly averages are based on the Friday quotations, and the yearly averages on the monthly.

DESCRIPTION	May	May	April	April	AVERAGE				Commercial	
	10	3	26	19	April	May	May		Season (*)	
	1940	1940	1940	1940	1940	1939	1938		1938-39	1937-38
Wheat										
Budapest: Tisza wheat, 78 kg. per hl. (pengő per quintal)	20.25	20.25	20.25	20.25	20.50	20.37	23.66		20.42	21.44
Braila: Home-grown, good qual. (lei p. ql.)	625	625	n. q.	630	635	413	548		411	520
Winnipeg: No. 1 Manitoba (cents p. 60 lb.)	90	89 1/8	88 7/8	90 1/8	89 1/8	65 1/8	115 1/8		62	131 1/8
Chicago: No. 2 Hard Winter (cents p. 60 lb.)	110 1/4	108	109 1/8	113	110 1/8 n.	80 1/8 n.	83 1/8		70 1/8	96 1/8
Minneapolis (cents per 60 lb.):										
No. 1 Northern	108 1/8	106 1/8	105 1/8	107 1/8	105 1/8	82 1/8	89 1/8		74 1/8	104 1/8
No. 2 Amber Durum	93 1/8	89 1/8	88 1/8	90 1/8	89 1/8	76 1/8	79 1/8		68 1/8	93 1/8
New York: No. 2 Hard Winter (f.o.b. cents per 60 lb.)	131 1/8	129 1/8	130 1/8	133 1/8	130 1/8	92 1/8	101 1/8		84 1/8	112 1/8
Buenos Aires (a): No. 2 Hard, 80 kg. per hl. (paper pesos per quintal)	9.15	9.60	9.50	8.80	8.76	7.00	10.40		6.89	12.20
Karachi: White Karachi, 2% barley, 1 1/2% impurities (rupees per 56 lb.) . . .	29-12-0	29-12-0	29-10-0	30-12-0	29-2-0	25-9-9	22-10-0		22-12-8	26-15-9
Antwerpen (francs per quintal):										
Home-grown	n. q.	158.00	158.00	158.00	158.00	129.50	133.75		123.75	135.05
No. 1 Manitoba (Atlantic; c.i.f., arrived) (*)	n. q.	158.00	162.00	160.00	160.45	92.10	159.35		96.25	171.20
Bahia (c.i.f., arrived)	n. q.	160.00	161.00	160.00	158.75	75.35	121.60		79.00	142.10
London, Mark Lane: English (sh. per 504 lb.; at farm)	*) 31/6	*) 31/6	*) 31/6	*) 31/6	*) 31/6	23/8 1/4	36 1/4 1/8		20/7 1/4	37/7 1/8
London, Baltic (f.o.b., parcels; sh. per 480 lb.):										
No. 1 Northern Manitoba (St. John) . .	*) 36 1/4 1/8	*) 36/6	*) 37 1/11 1/8	*) 37 1/4 1/8	*) 37 1/11	—	—		—	—
No. 1 Northern Manitoba (Pacific) . .	32 1/11 1/8	32 1/11 1/8	32 1/11 1/8	33/-	32/8	—	—		—	—
Barusso, 62 lb p. hl.	n. q.	*) 31/3	*) 31/-	29/3	28/11	—	—		—	—
Australian	27/6	27/6	27/9	27/6	26/4	—	—		—	—
Rye										
Budapest: Pest rye (pengő p. quintal) .	16.72	16.72	16.57	16.57	16.57	14.17	18.97		14.34	18.57
Winnipeg: No. 2 rye (cents p. 56 lb.) .	71 1/8	71 1/8	63 1/8	71 1/8	*) 68 1/8	46 1/8	57 1/8		40 1/8	72 1/8
Minneapolis: No. 2 rye (cents p. 56 lb.)	71 1/8	69	69	72 1/8	69	50	57 1/8		44	67 1/8
Antwerpen (francs per quintal):										
Home-grown	n. q.	...	...	...	...	n. q.	123.80		n. q.	124.85
Danubian (c.i.f., arrived)	n. q.	...	...	...	...	68.00	115.75		81.80	123.30
Soviet (c.i.f., arrived)	n. q.	...	...	...	...	54.50	98.85		61.15	112.50
Plata (c.i.f., arrived)	n. q.	130.00	131.00	134.00	134.25	64.35	115.50		80.80	124.55
Barley										
Braila: Average quality (lei p. quintal).	460	450	445	445	455	358	392		338	365
Winnipeg: No. 4 West. (cents p. 48 lb.) (*)	44 1/8	46 1/8	47 1/8	51	*) 49 1/8	38 1/8	54 1/8		34 1/8	56 1/8
Chicago: Feeding (on sample; cents p. 48 lb.)	45	45	45	45	45	39 1/8	48		40 1/8	51 1/8
Minneapolis: No. 2 Feeding (cents p. 48 lb.)	50 1/8	50 1/8	50 1/8	50 1/8	49 1/8	43 1/8	50 1/8		40 1/8	53 1/8
Antwerpen: (c.i.f., arrived; fra. per ql):										
Danubian	n. q.	...	...	...	...	73.00	105.00		75.45	106.10
No. 2 Federal (*)	n. q.	n. q.	n. q.	n. q.	n. q.	71.00	97.85		71.40	100.80
Plata 64/65 kg. per hl	n. q.	129.50	131.50	136.00	133.60	73.50	106.50		74.20	106.80
London, Mark Lane: English malting (sh. per 448 lb.; at farm)	70/-	70/-	70/-	70/-	70/-	35/-	47/6		36/1	53/-
London, Baltic (f.o.b. St. John, parcels; sh. per 400 lb.)										
No. 3 Canadian 6-row	n. q.	n. q.	n. q.	*) 24/3	*) 24/1	—	—		—	—
La Plata new crop	n. q.	n. q.	n. q.	15/6	*) 15/9	—	—		—	—
No. 1 Australian Chevalier (p. 448 lb)	29/6	28/9	28/9	28/9	28/9	—	—		—	—

* Indicates that the product was not quoted during part of the period under review. — n. q. = not quoted. — n. = nominal. — (a) Thursday prices.

(*) In relation to Government price fixing, numerous series are omitted from this table; notes concerning them have been given in various issues of the Crop Report: United Kingdom: Nov. 1939, p. 1060; Italy: Dec. 1939, p. 1163; Germany: Feb. 1940, p. 142; they will be continued. — (†) August-July. — (‡) As from Jan. 19, 1940: No. 2 Manitoba. — (§) As from Sept. 22, 1939: No. 2 Feeding barley. — (¶) As from Sept. 23, 1938: No. 3 Federal. — (||) Fixed maximum price; prices of seed wheat, which is not under control, are much higher. — (|||) Shipping June, f.o.b. Montreal. — (|||) Baril, 62 lb. per bushel. — (|||) April 12: 69 1/4. — (|||) April 12: 50; April 5: 49 1/4.

DESCRIPTION	May	May	April	April	AVERAGE				Commercial	
	10	3	26	19	April	April	May		Season 1)	
	1940	1940	1940	1940	1940	1939	1938		1938-39	1937-38
Oats.										
Winnipeg: No. 2 White (cents per 34 lb.)	38 1/4	37 1/4	37 1/4	39 1/4	*) 38 1/4	30 1/2	49 1/4		29	50 1/4
Chicago: No. 2 White (cents per 32 lb.)	42 1/2	42 1/4	42 1/4	45 1/4	44 1/4	35 1/2	30		30 1/4	32 1/4
Buenos Aires (a): No. 2 White, 49 kg. per hl. (paper pesos p. quintal)	5.30	5.40	5.40	5.50	5.47	4.40	6.22		4.81	6.32
London, Mark Lane: English white (sh. per 336 lb.; at farm)	*) 36/-	*) 36/-	*) 36/-	*) 36/-	*) 36/-	19/10 1/2	26/-		19/3 1/2	26/6 1/4
London, Baltic: No. 2 Canadian Western (f.o.b. St. John, parcels; sh. per 320 lb.)	n. q.	n. q.	n. q.	*) 21/1 1/2	*) 20/10	—	—		—	—
Milano (b) (lire per quintal):										
Home-grown	162.50	162.50	162.50	147.50	151.25	99.50	102.50		98.00	100.05
Foreign	n. q.	n. q.	n. q.	n. q.	n. q.	99.00	98.75		95.90	97.15
Maize.										
Braila: Average quality (lei p. quintal)	n. q.	n. q.	430	420	434	408	340		362	* 313
Chicago: No. 3 Yellow (cents p. 56 lb.)	70 1/4	68 1/4	66 1/4	67 1/4	63 1/4	51 1/4	58		51 1/4	83
Buenos Aires (a): Yellow Plata (paper pesos per quintal)	*) 4.55	*) 4.55	*) 4.70	*) 4.72	*) 4.70	6.04	8.16		6.89	7.79
Antwerpen (c.i.f. arrived; francs p. ql):										
Bessarabian	n. q.	n. q.	n. q.	n. q.	n. q.	81.35	* 100.85		87.90	n. q.
Yellow Plata	n. q.	136.00	141.00	143.00	140.50	82.00	111.00		90.20	101.00
Cinquantino (Argentine "Cuarentino")	n. q.	146.00	148.00	150.00	148.75	93.00	129.50		118.05	109.05
London, Baltic (f.o.b. parcels; sh. per 480 lb.):										
No. 2 Yellow American (Baltimore)	n. q.	n. q.	33/1 1/2	32/9	31/8 1/2	—	—		—	—
Yellow Plata	13/10 1/2	14/3	14/9	15/3	14/10	—	—		—	—
Rice (milled).										
									1939	1938
Rangoon (delivery current month; rupees per 7500 lb.):										
No. 2 Europe (Burma)	305-0	307-8	300-0	295-0	294-6	253-2	259-6		255- 2	255-12
Kanoungtoe, small mills specials	277-0	277-0	272-8	266-0	265-0	234-8	231-10		231- 9	219-12
Big mills specials	267-8	267-8	262-0	255-0	256-2	228-10	215-0		226-14	207- 0
London (a) shipping current or following month; sh. p. cwt.):										
No. 2 Burma (c.i.f. U. K.) (*)	n. q.	n. q.	n. q.	15 -	n. q.	8 2 1/4	8/6		* 7/8 1/4	8/3 1/4
Loonzain, Kanoungtoe (f.o.b. Rangoon)	6 1/2	7/-	7/-	6/10 1/2	6 10 1/2	—	—		—	—
No. 1 Saigon (f.o.b. Saigon)	7/9	7/9	7/7 1/2	7/3	7/3	—	—		—	—
Siam Super (f.o.b. Bangkok) (*)	7/9	7/9	7/9	7/10 1/2	7/11 1/4	—	—		—	—
Tokyo "Tyumai", brown Japanese, average quality (yens per koku)	43.30	43.30	43.30	43.30	43.30	35.20	34.10		37.27	34.26
Linseed.										
Buenos Aires (a): Current quality, 4 % impurities (paper pesos p. quintal)	18.15	19.10	19.10	19.10	18.89	14.40	14.50		15.12	14.31
Bombay: Bold (rupees per cwt)	10-0-6	9-14-0	9-14-0	9-12-0	9-12-7	7-5-1	7-1-6		7-12-7	7-4-10
Antwerpen: Plata (c.i.f., arrived, frs. per quintal)	n. q.	245.00	244.00	250.00	250.00	156.50	169.85		182.50	166.20
London (c.i.f., shipping current or following month; £ per long ton):										
La Plata	17- 5-0	18-2-6	17-12-6	17-6-3	17-5-4	11-10-11	11-14-1		* 12- 2-3	11-10-11
Bombay	19-15-0	21-2-6	21-2 -6	20-5-0	20-1-10	13-7 -10	12-18-9		* 14-10-3	13- 3- 9
Duluth: No. 1 Northern (futures; cents per 56 lb.) (*)	197	201	205	205	203 1/2	* 116 1/4	180 1/4		172 1/4	183 1/4
Minneapolis: No. 1 Northern (cts. p. 56 lb.)	198	203 1/2	206 1/2	210	209 1/2	178 1/4	184		180	190

* Indicates that the product was not quoted during part of the period under review. — n. q. = not quoted. — n. = nominal. — (a) Thursday prices — (b) Saturday prices.

(*) Oats: August-July; maize: May-April. — (†) London Standard. — (‡) Quotations refer to May futures from January to May, to July futures in June and July, to September futures in August and September, and to December futures during the other months. — (†) April 12: 38 1/4. — (†) Fixed maximum prices; prices of seed oats, which are not under control, are much higher. — (†) Shipping May, f.o.b. Montreal. — (†) New crop.

DESCRIPTION	May 10 1940	May 3 1940	April 26 1940	April 19 1940	Average				Commercial Season ⁽¹⁾	
	April 1940	May 1939	May 1938		April 1940	May 1939	May 1938		1938-39	1937-38
Cottonseed.										
Alexandria (a) (piastres per ardeb):										
Upper Egyptian	61.9	63.4	64.4	64.3	64.7	55.3	50.6		57.7	55.3
Sakellaridis	60.4	61.9	62.7	62.3	63.0	52.8	46.1		54.3	50.7
London: Egyptian (c.i.f., shipping current or following month, £ per long ton)	n. c.	n. c.	8-10-0	8-10-0	8-10-7	5-17-10	5-9-1		6-3-5	6-1-6
Cotton.										
New Orleans: Middling (cents p. lb.) . .	n. 9.97	n. 10.53	n. 10.58	n. 10.52	n. 10.53	9.32	8.66		8.75	8.87
New York: Middling (cents per lb.) . .	n. 10.32	n. 10.86	n. 10.93	n. 10.87	n. 10.88	9.59	8.50		9.00	8.75
Bombay (rupees p. 784 lb.):										
Broach, f.g. (futures) ⁽¹⁾	¹⁾ 238-0	¹⁾ 264-8	¹⁾ 266-8	¹⁾ 254-12	¹⁾ 256-9	¹⁾ 165-7	154-7		156-2	166-11
Broach, t.g. (spot)	251-0	259-0	257-0	252-0	248-4	168-12	155-12		* 156-6	* 162-9
Oomra, fine (spot)	232-0	238-0	238-0	234-0	230-12	160-0	140-8		148-12	* 148-13
Alexandria (a) (talariis per kantar):										
Sakellaridis, f.g.f.	19.85	19.85	19.85	19.85	19.82	11.26	12.36		12.37	14.19
Giza 7, f.g.f.	17.67	17.57	17.42	17.62	17.74	11.31	11.97		12.34	12.81
Ashmuni, f.g.f.	17.57	17.57	17.82	18.02	18.08	9.42	9.76		10.16	10.62
Liverpool (pence per lb.):										
Middling, super good	n. 8.74	n. 8.78	n. 8.67	n. 8.69	n. 8.63	6.09	5.45		5.88	5.79
Middling	8.14	8.18	8.07	8.09	8.03	5.41	4.65		5.17	4.97
São Paulo, g.f.	n. 8.39	n. 8.43	n. 8.32	n. 8.34	n. 8.28	5.29	4.85		5.14	5.16
Broach, good staple, f.g. ⁽¹⁾	n. 7.09	n. 7.09	n. 7.03	n. 7.00	n. 6.97	4.07	3.79	n.	3.92	4.04
C.P. Oomra, good staple, superfine ⁽¹⁾ .	7.14	7.04	6.98	7.05	7.03	4.36	4.01	*	4.11	4.29
Giza 7, f.g.f.	10.91	10.77	10.53	10.48	10.50	6.48	6.90		7.22	7.42
Upper Egyptian, f.g.f.	10.82	10.75	10.52	10.55	10.52	5.68	5.57		6.00	6.31
Butter.										
Köbenhavn (a) Danish, for export (crowns per quintal)	n. 264.00	n. 264.00	264.00	n. c.	258.00	216.75	229.00		239.00	230.49
Leeuwarden, Commission for butter quotations (a) Dutch, for export (cents per kg) ⁽⁴⁾	80	80	80	80	80 1/4	69 1/4	88 1/4		77 1/4	80 1/4
Antwerpen, auction: Belgian (frs p. kg) .	n. q.	20.90	20.70	21.25	23.49	18.75	21.15		20.70	23.30
New York (b) 92 score, creamery (cents per lb.) . . . . .	..	..	..	..	..	23 1/4	26 1/4		26 1/4	28
Cheese.										
Roma: Roman Pecorino, choice (lire per quintal)	1,210.00	1,210.00	1,210.00	1,210.00	1,210.00	1,100.00	1,047.50		1,110.25	1,058.30
Alkmaar: Edam 40+, National Mark, factory cheese, small (florins p. 40 kg.) .	n. q.	18.50	18.25	19.50	18.69	17.44	20.00		19.35	21.33
Gouda: Gouda 45+, National Mark, farm made, 1st quality (florins p. 50 kg.) .	n. q.	22.75	23.50	23.50	24.00	21.81	24.56		26.52	25.72
Eggs.										
Antwerpen, auction: Belgian, average quality (frs per 100)	n. q.	49.00	49.00	50.00	49.25	41.25	46.50		56.00	58.80
Denmark (c) Danish for export (crs. per quintal)	100.00	90.00	90.00	70.00	76.50	97.00	98.40		112.53	116.70
Apeldoorn (d) Dutch, average quality 57/58 gr. each (fl. per 100)	n. q.	..	..	..	¹⁾ ..	3.25	3.15		3.85	3.85
Barneveld (a) Dutch, average quality 57/58 gr. each (fl. per 100) . . . . .	..	..	..	..	¹⁾ ..	3.26	3.19		3.94	3.90

* Indicates that the product was not quoted during part of the period under review. — n. q. = not quoted. — n. = nominal. — (a) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks commencing on Thursdays. — (d) Prices on following Mondays.

⁽¹⁾ Cottonseed: Sept.-August; cotton: August-July. — ⁽²⁾ Quotations refer to April-May futures during the period September-May following, and to July-August futures during the other months. — ⁽³⁾ As from March 15, 1939: "fair staple". — ⁽⁴⁾ For home prices these quotations must be increased by a consumption tax which, as from Oct. 19, 1939, amounts to 80 cents per kg. — ⁽⁵⁾ July-August futures. — 6) See note on page 371.

**INDEX-NUMBERS OF PRICES OF AGRICULTURAL PRODUCTS
AND OF COMMODITIES BOUGHT BY THE FARMER**

DESCRIPTION	March	Feb	Jan	Dec	Nov	Oct	March	March	YEAR	
	1940	1940	1940	1939	1939	1939	1939	1938	1938 39	1937 38
									(*)	(*)
Germany										
(Statistisches Reichsamt products sold by farmers)										
Average for corresponding months 1909 10/1913 14 = 100										
Cereals	112	111	112	113	112	109	113	110	111	110
Edible potatoes	114	106	110	111	108	108	114	114	116	114
Plant products	112	110	112	113	111	109	114	110	112	111
Meat animals	99	99	98	97	96	95	98	95	97	95
Livestock products (butter and eggs)	116	107	109	108	106	105	107	104	111	109
Livestock and livestock products	104	102	101	100	99	98	100	98	101	99
Total agricultural products	*) 106	104	104	104	103	102	103	101	104	102
Germany										
(Statistisches Reichsamt wholesale products)										
1913 = 100										
Agricultural products	*) 110.1	108.1	108.2	107.6	107.5	107.5	107.8	105.6	107.9	105.9
Fertilizers	55.3	55.3	54.5	53.5	52.9	52.9	57.3	57.6	54.6	55.3
Consumption goods (1)	138.5	138.1	137.5	137.0	136.7	136.3	135.4	135.7	135.9	135.4
Wholesale products in general	*) 109.4	108.4	108.2	107.6	107.4	107.1	106.6	105.8	106.9	105.7
England and Wales (1)										
(Ministry of Agriculture and Fisheries)										
Average 1927 1929 = 100										
A UNCORRECTED FOR SEASONAL VARIATION										
Cereals and farm crops	.	.	.	101	95	91	83	88	86	86 1/2
Livestock and livestock products	.	.	.	115	107	96	92	91	93	88
Total agricultural products	.	.	.	112	105	96	90	91	92	90
Wholesale products in general (1)	111.0	110.1	107.6	104.8	101.6	95.0	82.8	89.2	88.3	86.9
B CORRECTED FOR SEASONAL VARIATION										
Cereals and farm crops	.	.	.	102	95	90	85	90	—	—
Livestock and livestock products	.	.	.	103	98	92	92	91	—	—
Total agricultural products	.	.	.	103	97	91	90	91	—	—

(1) Household goods of all kinds, and clothing — (1) Index numbers taking account of payments under the Wheat Act, the Cattle Subsidy Act, and Government payments for milk — (1) Index-numbers by the Board of Trade reduced to 1927-1929 = 100 — (1) Agricultural year: July 1-June 30 — (1) April 110 — (1) April 111 2 — (1) April 109 6

DESCRIPTION	March	Feb	Jan.	Dec.	Nov.	Oct.	March	March	YEAR	
	1940	1940	1940	1939	1939	1939	1939	1938	1939	1938
Argentina										
(Banco Central de la Republica Argentina) 1926 = 100.										
Cereals and linseed	75.2	73.1	79.9	85.0	80.7	80.3	78.1	107.3	77.6	90.6
Meat	103.1	103.8	103.7	105.1	108.9	102.2	88.8	95.3	94.9	94.8
Hides and skins	111.8	111.7	111.3	112.3	103.6	106.8	84.3	85.3	89.2	81.9
Wool	146.7	152.5	141.9	131.8	131.9	135.1	85.5	92.2	103.9	92.5
Dairy products	77.2	76.8	75.7	82.0	87.3	92.2	78.1	96.9	83.0	83.9
Forest products	116.1	116.1	116.6	116.6	109.5	109.5	101.6	100.6	104.2	100.0
Total agricultural products	^{a)} 88.4	87.3	91.0	93.8	90.9	90.4	81.1	102.1	83.6	90.6
Non agricultural commodities	133.6	133.0	134.1	129.1	129.1	126.2	109.0	111.1	114.8	109.4
Wholesale products in general	^{a)} 124.0	123.3	124.9	121.7	121.0	118.7	103.2	109.4	108.2	105.5
Australia (Commonwealth)										
(Commonwealth Bureau of Census and Statistics) 1928-29 = 100.										
									1938-39 (¹)	1937-38 (¹)
Agricultural field products	77.8	76.8	78.5	73.0	77.4	83.8	76.2	86.9	80.3	84.8
Pastoral products	82.2	69.7	77.9	77.8	77.4	76.6	75.4	70.5	71.4	79.0
Farmyard and dairy products	84.9	85.0	85.5	85.6	85.6	85.6	90.9	80.3	89.3	82.9
Total agricultural products	81.6	79.7	79.6	77.7	79.0	80.7	78.2	77.9	77.8	81.7
Belgium										
(Belgische Boerenbond — Boerenbond belge) Average of corresponding months 1909-1914 = 100.										
									1939	1938
Field products	775	755	717	647	608	597	486	564	548	561
Livestock products	658	686	659	635	634	634	634	635	637	689
Total agricultural products	695	708	677	639	626	622	587	612	609	649
Rent	660	650	650	650	650	650	650	650	650	650
Agricultural wages	990	980	970	960	950	940	905	870	924	887
Fertilizers	515	518	519	512	513	495	474	467	479	471
Feedingstuffs	853	810	786	706	637	696	545	662	582	631
Total production expenses (including those not specified)	829	815	806	805	788	794	753	758	747	741
Canada										
(Dominion Bureau of Statistics, Internal Trade Branch) 1926 = 100.										
Field products (grain, etc.)	63.1	61.5	60.8	58.7	52.0	51.4	54.9	83.8	54.2	69.0
Livestock and livestock products	84.9	85.0	85.5	86.5	87.0	86.3	82.1	81.7	81.4	81.3
Total Canadian farm products	71.3	70.3	70.0	69.1	65.1	64.5	65.1	83.0	64.4	73.6
Fertilizers	85.9	85.9	82.9	82.9	82.9	82.9	83.4	75.2	83.0	78.9
Consumers' goods (other than foodstuffs, beverages and tobacco)	85.2	84.8	83.8	82.9	82.7	80.1	75.4	77.6	77.1	77.2
Wholesale products in general	83.2	82.8	82.6	81.7	80.3	79.3	73.2	83.1	75.4	78.6

(¹) July 1-June 30. — (²) April: 90.1. — (³) April: 123.7.

DESCRIPTION	March	Feb.	Jan.	Dec.	Nov.	Oct.	March	March	YEAR	
	1940	1940	1940	1939	1939	1939	1939	1938	1939	1938
Chili										
(Dirección General de Estadística)										
1913 = 100										
Cereals . . . . .	...	449.2	445.5	445.2	449.1	446.2	438.9	539.3	441.1	551.0
Other plant products . . . . .	...	443.6	432.9	416.5	431.3	431.0	341.8	358.8	396.9	375.4
Meat animals . . . . .	...	390.4	386.8	406.6	419.2	423.3	327.2	383.2	366.1	380.3
Meat . . . . .	...	346.7	351.5	356.8	358.9	386.9	280.5	312.2	303.4	324.7
Total agricultural products . . . . .	...	430.6	424.2	418.4	428.4	430.5	363.9	411.5	400.7	424.3
Domestic industrial products . . . . .	...	452.9	446.8	445.9	447.2	443.4	429.5	471.9	433.6	472.5
Wholesale products in general . . . . .	...	532.4	526.3	523.0	526.6	523.3	475.6	507.4	496.7	510.7
United States										
(Bureau of Agricultural Economics)										
Average 1909-10 to 1913 14 = 100.										
A: UNCORRECTED										
FOR SEASONAL VARIATION										
Cereals	92	91	90	87	79	77	66	85	72	74
Cotton and cottonseed	85	85	85	82	75	74	71	70	73	70
Fruits	73	76	66	65	66	73	81	69	77	73
Meat animals	102	101	103	101	107	112	116	117	110	114
Dairy products	114	118	119	118	117	112	100	117	104	109
Chickens and eggs	83	98	91	97	117	108	88	93	94	108
Miscellaneous	101	107	113	104	98	94	83	89	93	98
Total agricultural products	97	101	99	96	97	97	91	96	92	95
Commodities bought for use in living and production	122	122	122	122	122	122	120	125	121	122
Prices, interest and taxes paid by farmers	128	128	128	128	128	128	126	130	127	127
Agricultural wages ⁽¹⁾	124	—	119	—	—	126	121	112	122	124
B: CORRECTED										
FOR SEASONAL VARIATION										
Cereals	90	90	91	89	82	80	65	83	—	—
Cotton and cottonseed	86	87	88	86	77	75	72	71	—	—
Fruits	73	82	72	73	75	75	82	72	—	—
Truck crops (market garden crops)	128	168	117	96	130	128	114	101	—	—
Meat animals	99	102	107	107	112	113	113	114	—	—
Dairy products	111	114	114	112	113	111	98	115	—	—
Chickens and eggs	101	97	80	76	92	96	107	112	—	—
Miscellaneous	107	114	114	104	95	94	87	94	—	—
Total agricultural products	98	102	100	97	97	96	92	98	—	—
Agricultural wages ⁽¹⁾	127	—	124	—	—	122	123	123	—	—
United States										
(Bureau of Labor)										
1926 = 100.										
Grains	73.4	72.8	73.5	71.6	64.1	61.6	54.5	69.0	58.7	60.6
Livestock and poultry	67.1	65.6	67.2	63.8	66.1	70.6	78.2	82.7	72.2	79.0
Other farm products	66.3	68.9	68.6	68.4	68.3	66.1	61.0	62.8	62.6	63.9
Total agricultural products	67.9	68.7	69.1	67.6	67.3	67.1	65.8	70.3	65.4	68.5
Agricultural implements	93.4	93.4	93.4	93.3	93.3	93.4	93.2	96.2	93.4	95.5
Fertilizer materials	70.6	71.0	71.3	74.5	73.0	70.6	69.7	71.8	70.0	69.2
Mixed fertilizers	73.9	74.2	73.9	73.7	72.6	72.6	73.8	71.6	73.0	72.2
Cattle feed	95.2	93.7	93.0	91.7	91.5	82.9	84.1	85.1	82.0	76.9
Non-agricultural commodities	80.5	80.8	81.5	81.8	81.6	82.0	79.0	81.6	79.6	80.6
Wholesale products in general	78.4	78.7	79.4	79.3	79.2	79.4	76.7	79.7	77.2	78.6

(1) 1910-1914 = 100. — (2) April 1939 and 1938 respectively. — (3) April: 98. — (4) April: 99. — (5) April: 69.4 — (6) April: 78.6.

DESCRIPTION	March	Feb.	Jan.	Dec.	Nov.	Oct.	March	March	YEAR	
	1940	1940	1940	1939	1939	1939	1939	1938	1939	1938
Hungary										
(Central Royal Bureau of Statistics)										
1929 = 100.										
Cereals	91.2	89.7	88.9	87.7	86.8	85.1	88.6	89.1	85.9	89.1
Total raw plant products ⁽¹⁾	92.1	91.0	88.8	82.5	79.9	80.0	80.8	71.8	79.5	76.9
Meat animals, meat and lard	76.3	75.2	69.0	65.7	66.6	67.9	61.7	71.4	65.1	68.4
Total livestock products ⁽¹⁾	76.2	75.9	71.5	67.7	68.4	66.8	64.1	67.3	65.6	65.6
Total agricultural products	⁽¹⁾ 87.1	86.3	83.4	77.8	76.3	75.9	75.6	70.4	75.2	73.4
Products of agricultural industries	96.3	95.8	96.6	95.7	95.0	93.8	95.0	104.8	93.9	103.0
Industrial raw materials and products	97.4	97.0	96.5	96.0	95.3	94.5	92.0	94.1	93.1	93.3
Wholesale products in general	⁽¹⁾ 93.6	93.0	91.7	89.2	88.2	87.5	86.0	86.2	86.3	86.8
Ireland										
Department of Industry and Commerce)										
Average 1911-1913 = 100.										
Agricultural products in general	145.4	141.2	133.6	137.9	134.2	133.2	110.4	108.3	120.7	111.9
Lithuania										
(Lietuvos Bankas)										
1926-1929 = 100.										
Cereals	68	61	56	54	50	46	41	43	43	41
Cattle, fowls	64	59	55	54	53	53	54	50	53	51
Leather, hides, wool	80	78	75	74	71	57	53	51	56	51
Meat, dairy products and eggs	65	63	58	57	53	50	47	46	48	47
Total agricultural products	67	62	57	56	53	50	47	46	48	46
Wholesale products in general	76	72	67	64	60	56	52	51	54	51
Norway										
(Kgl. Selskap for Norges Vel)										
Average 1909-1914 = 100.										
Cereals	175	175	173	170	170	170	163	175	168	168
Potatoes	297	236	212	206	202	217	141	210	186	174
Pork	144	151	160	159	154	154	116	113	141	127
Other meat	174	170	167	173	166	168	169	193	168	179
Dairy products	198	198	193	193	192	188	179	173	186	176
Eggs	164	126	107	132	165	157	99	110	129	124
Concentrated feedingstuffs	177	178	174	170	167	159	155	152	163	158
Maize	179	179	175	172	170	168	160	153	165	158
Fertilizers	121	111	113	112	112	90	94	103	101	98
New Zealand										
(Census and Statistics Office)										
Average 1909-1913 = 100.										
Dairy products . . . . .	...	133.2	132.8	132.5	129.2	126.2	123.9	110.9	123.0	121.0
Meat . . . . .	...	181.4	183.4	173.8	166.4	158.1	167.2	177.9	163.5	175.2
Wool . . . . .	...	149.1	148.7	107.1	107.1	108.1	110.4	117.0	109.8	117.6
Other pastoral products . . . . .	...	131.1	119.9	131.9	117.0	107.9	85.0	119.1	93.4	94.7
All pastoral and dairy products . . . . .	...	150.7	150.2	137.7	133.2	129.0	129.8	132.1	128.9	134.0
Field products . . . . .	...	154.6	157.2	154.5	154.5	154.5	153.4	133.3	146.1	139.6
Total agricultural products . . . . .	..	150.8	150.4	138.1	133.7	129.6	130.4	132.1	129.3	134.2

⁽¹⁾ Including unspecified products. — ⁽²⁾ Agricultural year: April 1-March 31. — ⁽³⁾ April: 87.9. — ⁽⁴⁾ April: 94.3.

DESCRIPTION	March	Feb.	Jan.	Dec.	Nov.	Oct	March	March	YEAR	
	1940	1940	1940	1939	1939	1939	1939	1938	1938-39 (¹)	1937-38 (¹)
Netherlands										
(Bureau of Agriculture)										
Average 1924-25 to 1928-29 = 100.										
Plant products	73	74	71	70	70	68	59	60	62	65
Livestock products	77	75	73	69	70	70	64	65	64	67
Total agricultural products	76	75	72	69	70	69	63	64	63	66
Wholesale products in general (¹)	88.1	87.6	86.2	84.7	83.6	80.8	70.2	73.2 (¹)	73.7 (¹)	71.9
Agricultural wages	75	75	75	75	75	75	74	68	74	69
Sweden										
(Sveriges Allmänna Lantbruksallskap)										
Average 1909-1913 = 100.										
Cereals . . . . .	...	...	...	134	133	126	103	123	113	114
Plant products (¹) . . . . .	...	...	...	135	134	127	104	123	115	115
Meat animals . . . . .	...	...	...	151	152	158	142	126	150	133
Dairy products . . . . .	...	...	...	183	171	166	161	143	160	142
Livestock and livestock products . . . . .	...	...	...	174	167	164	154	138	157	139
Total agricultural products . . . . .	...	...	...	161	156	152	138	133	143	131
Feedingstuffs . . . . .	...	...	...	165	164	162	141	139	149	140
Fertilizers . . . . .	...	...	...	102	100	100	94	97	96	96
Building materials . . . . .	...	...	...	220	220	217	187	187	201	182
Machinery and implements . . . . .	...	...	...	232	228	228	204	225	211	218
Sundries . . . . .	...	...	...	151	139	135	120	129	127	124
Total commodities purchased . . . . .	...	...	...	168	164	163	144	148	151	146
Wholesale products in general . . . . .	...	...	...	...	162	159	134	140	...	137
Switzerland										
(Schweizerischer Bauernverband)										
1914 = 100										
Slaughter cattle	125	121	124	132	132	129	108	120	118	117
Slaughter pigs	140	140	141	141	143	143	123	127	128	125
Milk (base price)	129	129	123	123	123	117	121	119	121	120
Total agricultural products	¹) 133	131	130	132	132	128	117	122	122	126
Feedingstuffs (¹)	132	131	129	127	124	121	111	99	113	105
Fertilizers (¹)	105	102	100	104	105	109	101	91	101	96
Wholesale products in general (¹)	¹) 132.1	129.7	127.7	125.1	122.6	120.1	105.3	108.2	111.2	107.1
Yugoslavia										
(National Bank of the Kingdom of Yugoslavia)										
1926 = 100.										
Plant products	¹) 101.4	97.0	91.7	90.7	87.0	76.8	85.3	84.4	82.5	85.8
Livestock products	¹) 89.0	83.6	85.3	82.8	80.7	71.0	63.1	65.6	68.7	65.8
Industrial products	99.5	96.5	95.5	91.6	86.5	82.9	76.6	79.5	79.8	78.2
Wholesale products in general	¹) 98.5	94.9	93.3	90.9	86.8	80.1	76.9	78.6	79.3	78.3

(¹) Index numbers calculated by the Central Statistical Bureau of the Netherlands; base 1926-1930. — (²) Including unspecified products. — (³) Index numbers calculated by the Bundesamt für Industrie, Gewerbe und Arbeit, base July 1914. — (⁴) Agricultural year July 1 - June 30. — (⁵) Calendar year. — (⁶) April: 136. — (⁷) April: 134.2. — (⁸) April: 106.3. — (⁹) April: 89.6. — (¹⁰) April: 102.4.

LATEST INFORMATION

Yugoslavia The following table shows the recently published official estimates of harvested area and production of the principal crops in 1939 and comparative figures for 1938 and the average

CLASSIFICAT.	HARVESTED AREA						PRODUCTION					
	Average			Average			Average			Average		
	1933			1933			1933			1933		
	1939	1938	to 1937	1939	1938	to 1937	1939	1938	to 1937	1939	1938	to 1937
	ooo acres			ooo centals			ooo bu.-hels			ooo bu.-hels		
			% 1939			% 1939			% 1939			% 1939
			1938			1938			1938			1938
			— 100 = 100			— 100 = 100			— 100 = 100			— 100 = 100
Wheat	5,444	5,262	5,236	103.4	104.0	63,397	66,799	51,801	105,659	111,329	86,334	94.9
Rye	638	627	625	101.8	102.1	5,369	5,007	4,627	9,587	8,941	8,262	107.2
Barley	1,027	1,026	1,045	100.1	98.3	9,353	9,287	9,059	19,485	19,349	18,872	100.7
Oats	882	894	902	98.6	97.8	7,678	7,199	7,103	23,993	22,496	22,195	106.7
Maize	6,625	6,802	6,455	97.4	102.6	89,191	104,849	98,225	159,269	187,232	175,403	85.1
Meatlin	168	167	150	100.4	112.0	1,437	1,334	1,186	2,477	2,300	2,044	107.7
Spelt	38	41	41	92.3	92.4	258	249	286 ¹⁾	25,833 ¹⁾	24,859 ¹⁾	28,584	103.9
Rice (rough)	9	9	7	103.7	135.7	157	141	77	350	313	171	111.8
Potatoes	650	658	635	98.9	102.4	30,252	37,515	34,534	50,419	62,524	57,556	80.6
Potatoes (mi- xed crop)	—	—	—	—	—	247	199	349	411	332	582	124.0
Sugar beet	100	72	67	138.7	148.9	16,548	12,290	11,002 ²⁾	827 ²⁾	614 ²⁾	550	134.7
Cotton (gin- ned)	12	12	4	99.7	314.1	24	27	7 ³⁾	5 ⁴⁾	6 ⁵⁾	1	87.8
Linseed	—	—	30	101.9	119.6	33	30	25	60	53	44	111.6
Flax (fibre)	36	35	3	101.9	119.6	264	285	236 ⁶⁾	26,415 ⁶⁾	28,478 ⁶⁾	23,617	92.8
Hempseed	—	—	4	99.7	314.1	6,863 ⁷⁾	6,597 ⁷⁾	5,433 ⁷⁾	6,863 ⁷⁾	6,597 ⁷⁾	5,433	104.0
Hemp (fibre)	142	141	108	100.2	131.5	117,967 ⁸⁾	122,135 ⁸⁾	90,332 ⁸⁾	117,967 ⁸⁾	122,135 ⁸⁾	90,332	96.6
Hops	7	7	6	100.6	115.0	4,002 ⁸⁾	3,527 ⁸⁾	3,917 ⁸⁾	4,002 ⁸⁾	3,527 ⁸⁾	3,917	113.5
Tobacco	44	40	34	107.8	127.8	34,024 ⁸⁾	32,425 ⁸⁾	27,097 ⁸⁾	34,024 ⁸⁾	32,425 ⁸⁾	27,097	104.9
Cocoa	34	44	33	78.2	104.4	172	198	210	344	395	420	87.2
Sesame	4	4	2	114.0	176.4	12	11	6 ⁹⁾	586 ⁹⁾	525 ⁹⁾	236	115.1
Olives	—	—	—	—	—	846	676	573 ⁹⁾	84,580 ⁹⁾	67,607 ⁹⁾	57,317	125.1
Olive oil	—	—	—	—	—	130	136	89 ⁹⁾	1,737 ⁹⁾	51,812 ⁹⁾	1,193	95.9
Vines	—	—	—	—	—	17,107	17,530	15,104 ⁹⁾	1,710,692 ⁹⁾	1,713,024 ⁹⁾	510,433	97.6
Wine	551	540	509	102.0	108.3	104,222 ⁹⁾	102,776 ⁹⁾	83,176 ⁹⁾	125,162 ⁹⁾	123,425 ⁹⁾	99,886	101.4
Sown area												
Mangels	80	80	80	100.7	100.4	10,397	11,483	10,364 ⁹⁾	520 ⁹⁾	574 ⁹⁾	518	90.5
Clover	305	296	278	103.0	109.6	8,816	9,553	8,840 ⁹⁾	441 ⁹⁾	478 ⁹⁾	442	92.3
Alfalfa	268	259	226	103.5	118.4	9,433	9,113	7,668 ⁹⁾	472 ⁹⁾	456 ⁹⁾	383	103.5
Permanent grass (hav)	4,618	4,550	4,551	101.5	101.5	62,344	70,123	71,075 ⁹⁾	3,117 ⁹⁾	3,506 ⁹⁾	3,554	88.9
Pasture	10,607	10,817	10,741	98.1	98.7	—	—	—	—	—	—	—
Sericulture	15,591 ⁹⁾	14,110 ⁹⁾	19,786	110.5	78.8 ⁹⁾	1,547 ⁹⁾	1,059 ⁹⁾	1,207 ⁹⁾	1,547 ⁹⁾	3,059 ⁹⁾	1,207	146.1

(1) Thousand pounds — (2) Thousand short tons — (3) Thousand bales of 478 lb. — (4) Short tons — (5) Thousand American gallons — (6) Thousand imperial gallons. — (7) Ounces of silkworm eggs. — (8) Thousand pounds of cocoons

CROP CONDITIONS IN THE UNITED STATES

A cable received on May 30 states that during the past week unseasonably cool weather continued to be general from the Rocky Mountains eastward with rain needed in South Dakota, Nebraska and the eastern Great Basin. Small grain crops are developing satisfactorily in most parts of the eastern section with spring wheat condition favourable except in dry areas. Maize planting is generally retarded by rain except in Iowa. The cotton belt needs rain in the southeast and warmer weather in the centre and southwest.

Prof. UGO PAPI, *Segretario generale dell'Istituto, Direttore responsabile.*

MONTHLY CROP REPORT AND AGRICULTURAL STATISTICS

The following explanations refer to crop conditions quoted in the crop notes and in the tables. — Crop condition according to the system of the country: Germany, including Ostmark and Sudetenland, Bohemia and Moravia (Protectorate); Hungary and Luxemburg: 1 = excellent, 2 = good, 3 = average, 4 = poor, 5 = very poor; Finland: 8 = very good, 6 = above the average, 5 = average; France: 100 = excellent, 70 = good, 60 = fairly good, 50 = average, 30 = poor; Estonia, Latvia, Lithuania, Poland, Romania and Sweden: 5 = excellent, 4 = good, 3 = average, 2 = poor, 1 = very poor; Netherlands: 90 = excellent, 70 = good, 60 = fairly good, 50 = below average; Portugal: 100 = excellent, 80 = good, 60 = average, 40 = poor, 20 = very poor; Switzerland: 100 = excellent, 90 = very good, 75 = good, 60 = fairly good, 50 = average, 40 = rather poor, 30 = poor, 10 = very poor; U. S. S. R.: 5 = good, 4 = above the average, 3 = average, 2 = below average, 1 = poor; Canada: 100 = crop condition promising a yield equivalent to the average yield of a long series of years; United States: 100 = crop condition which promises a normal yield; Egypt: 100 = crop condition which promises a yield equal to the average yield of the last five years. — For other countries the system of the Institute is employed: 100 = crop condition which promises a yield equal to the average of the last ten years.

NOTE: The countries are listed throughout by continents (Europe, followed by the U. S. S. R., America, Asia, Africa and Oceania) in the French alphabetical order. In the tables the Northern Hemisphere precedes the Southern Hemisphere.

1940

No. 6

VEGETAL PRODUCTION

WHEAT CROP PROSPECTS.

For many years the Institute has in June given the first numerical forecast of wheat production in Europe, based on the data for areas sown in each country and on the probable unit-yields indicated by the state of the crops. This forecast, with all the reserves necessary even under normal conditions, can be made when the necessary statistical data and exact information on the situation of the wheat crop, if not in all countries, at least in the great majority, are available, completing the lack of sufficient official information with that gathered from other reliable sources. It is obvious that under the present conditions, when not only the belligerent States, but even a number of neutral countries have suspended the publication of statistical data and information of a general economic character, and especially that regarding agriculture, we must, owing to unforeseen circumstances, give up the idea of making this numerical forecast.

However, the official and unofficial information available to the Institute at the present time, furnishes elements which enable us to form, at least along general lines, well founded opinion on the present situation of cereal crops in Europe. We are in possession of official statistical data for areas sown to cereals in Europe only for a few countries, *e. g.*, Greece, Lithuania, Luxemburg and Romania, and for these only for winter wheat; unofficial information available in this respect, is also inadequate. Consequently one of the fundamental statistical elements for the compilation of a numerical estimate is missing. On the other hand, there is much more information on wheather, on the execution of sowing and on the condition of the crops. This information, though referred

only to a limited number of countries, when grouped according to their relative geographical position, allows us to give an interesting review of the situation of the wheat crop for a considerable portion of European territory, allowing that sometimes the geographical proximity of a given country may give, naturally without vouching for its accuracy, some indication also for the adjacent countries or at least for a vast regions of these countries.

For the Scandinavian countries we possess official information only for Finland and Sweden. In Finland the temperature during the month of May was far above the average, and atmospheric precipitations were only 40 per cent. of the average quantity. In Sweden the condition of the wheat crop on June 1 was considerably below average.

For the Baltic countries information is available only for Lithuania. The generally dry, cold and windy weather and night frosts during the month of May were unfavourable to growth, and the condition of the wheat crop, which already on May 1 was below average, slightly deteriorated on June 1.

In the Soviet Union, there were atmospheric precipitations almost everywhere during the period under consideration, especially towards the end of May and at the beginning of June; however in the central regions the lack of moisture in the soil already began to make itself felt, but in some zones it was compensated for by the abundant reserves of water which had been accumulated after the heavy falls of snow during the winter. The frequent returns of cold spells registered almost everywhere have considerably delayed the development of cereals. On June 10 the condition of the winter and spring wheat crops was considered good in the Caucasus, the Crimea and Ukraina, while in some central zones the crop suffered not only from cold, but also from drought. In the Asiatic territory the condition of the winter and spring wheat crops varied from good to excellent.

• With regard to the area sown to wheat during the present season, we possess only total figures for all the winter cereals sown in the Kolkhozy during the autumn of 1939 which occupy 83,320,000 acres, as against 76,776,000 acres on the average for the quinquennium 1933-1937. It must be noted that the average figures do not include those areas which were not harvested owing to damages caused by the winter. From these figures the fact emerges that the areas sown during the Fall of 1939 are larger than those of the above-mentioned five-years average. The total area sown to winter cereals in all the categories of holdings, comprises mainly rye and wheat. In fact during the quinquennium 1933-1937, out of a total of 88,952,000 acres, winter rye occupied 55,394,000 acres, wheat 32,234,000 acres and barley only 1,325,000 acres.

We do not possess figures for the area sown to spring wheat in the Union, but according to certain evidence it has been extended, above all by substituting wheat for certain secondary cereals.

In Rumania, where during the two weeks from May 30 to June 12 rather cold and wet weather predominated, the condition of the winter wheat crop was considered as satisfactory in mid-June. With regard to spring cereals an increase in area as compared to last year is anticipated and their situation at the middle of June was considered very good.

In Hungary, where the trend of the season has been irregular, the total wheat harvest is, according to the official forecast based on the condition of the crop on June 22, below the average.

In Yugoslavia cold and wet weather predominated during the greater part of the month of May; the more propitious weather conditions during the third decade of May and in the beginning of June brought a certain improvement in the situation of cereals which had already suffered before from the rigours of winter and from spring floods. According to unofficial sources, the area sown to wheat in Yugoslavia underwent a considerable reduction on account of a decrease in the areas sown in autumn and the damage caused by floods; always according to the same sources, the harvest will be considerably below the abundant harvests of the two preceding years.

In Bulgaria, where the cold and rainy spring season had considerably retarded the growth of the cereal crops, on account of sunshine and warm weather during the first half of June their condition has improved, and the forecast was for rather high yields.

In Greece, the wheat crop, according to unofficial sources, has been affected by unfavourable weather conditions.

In Italy, the forecast for the wheat harvest, in spite of unfavourable weather conditions during part of the spring, is, according to official sources, that it will be satisfactory and about the same as that of 1939, thanks above all to the efficacious care given to the crops and the abundant fertilizing.

As regards the other European countries, information is lacking for all the central region both with regard to areas sown and the trend of the season during all the present campaign, with the exception of Switzerland where, if the weather continues good until reaping, according to official sources a good harvest is anticipated, lower, however, than that of last year, especially for winter wheat.

In the western part of Europe the weather during the period under consideration has not been too adverse to the normal development of cereals according to fragmentary information from unofficial sources; however in some zones, the crops have suffered from cold and in some parts also from drought.

To sum up, according to the above-mentioned sources, the present situation of cereals in Europe, gives reason to believe that for the Balkan countries the wheat harvest may be considered as below the abundant harvests obtained in 1939 and 1938; for all the other European countries for which the above information has been collected, the forecasts for the wheat harvest, based on the situation as it appeared during the first fortnight of June, were that it would be about average. The fact must not be lost sight of, however, that other factors may have a considerable influence on the results of this year's harvest, such as for example, the more or less normal carrying out of crop care, and the damage probably suffered owing to the war in the zones which generally give the highest unit-yields of wheat in Europe. Another factor also must not be forgotten, that is the considerable delay in the development of vegetation, and that consequently until reaping takes place the favourable or unfavourable course of weather conditions may exercise a considerable influence in one direction or another.

The improvement in the situation of the winter wheat crop in the United States results from the following first four estimates of the crop made up to the present. According to the first estimate made in December 1939, a harvest of 399 millions bushels was anticipated; the second estimate made on April 1, increased the figure to 426 million; the third, made on May 1 increased the figure still more to 460 million and finally the fourth estimate, made on the basis of the condition of the crop on June 1, brought the figure to 489 million bushels, so that according to this last estimate this year's winter wheat harvest will be respectively only 13.2 per cent. below, and 12.6 per cent. below the harvests for 1939 and the preceding five-year average. During the first two decades of June the weather remained favourable to the crops which are rapidly developing. Winter wheat taken on the whole has maintained its good conditions. As to spring wheat, the situation on June 1 was considered as 88 per cent. of the normal as against 71 per cent. on the corresponding date last year. Towards the end of the second decade of June the forecasts for the harvest for the greater part of the spring wheat crop varied from good to excellent.

In Canada weather conditions during the month of May were favourable to the development of cereals in the majority of the regions, and the condition of the crop on May 31, expressed as a percentage of the longtime average yield, was approximately 98 for winter wheat, 96 for spring wheat and 96 for winter and spring wheat taken together. The corresponding figures for last year were 98, 94 and 94.

According to a telegram of June 5, sowing was finished in Canada on the Prairies. The forecasts were good in the southern part of Manitoba, in the south and west of Saskatchewan and in the greater part of Alberta; however rain was urgently needed in the north of Manitoba, and the centre and north of Saskatchewan where during the preceding period its need had already been felt.

As to the Asiatic countries, weather conditions of the month of May have in India been propitious on the whole, in the zones of late-maturing crops. The provisional estimate of about 400 million bushels may therefore be taken as representing the definite estimate.

In Japan, weather conditions were normal and winter made satisfactory progress. The sowing of spring cereals was carried out in good time and under normal conditions.

In Palestine winter cereals wintered under excellent conditions and the sowing of spring cereals was carried out under good conditions and, thanks to the sufficient quantity of moisture accumulated during the month of April and the first fortnight of May, cereals are developing well.

As regards Africa, we are in possession of information only for Algeria and Egypt. In the former, the situation of cereals at the end of May was somewhat irregular owing to the insufficiency of rain in some regions; in Egypt the situation on June 1 was above the average and it was slightly improved as compared to May 1 last.

Finally in Argentina the preparatory work for cereal sowing was carried out under good conditions.

CURRENT INFORMATION FROM VARIOUS COUNTRIES ON WHEAT, RYE, BARLEY AND OATS.

Bulgaria: The cold and rainy weather prevailing during the spring retarded the growth of winter cereal crops by about three weeks and arrested the vegetation of spring cereal crops. These unfavourable weather conditions have damaged the crops on about 198,000 acres, particularly in the northern districts, while the abundant rains, with frequent hail-storms, during the second half of May, have flooded some zones and caused serious damage to the crops in most districts. However, thanks to the measures taken promptly by the Government, the greater part of damaged areas have been resown with maize, millet, or vegetable food crops.

During the first half of June weather conditions became better and temperatures warmer, so that cereal crops showed a marked advance, and, at the beginning of the second half of June crop condition promised a rather good yield.

Finland: During May the average temperature was exceeded by 2.7 degrees, the rainfall of 2.1 millimetres being 40 per cent. of the average atmospheric precipitation.

Hungary: The weather was warm, sunny and dry during the week ending May 28, but was again cold and rainy during that ending June 4.

The average day temperature rose rapidly from 22° C. on May 22 to between 25° and 28° C. from May 24 to 30. During the early days of June it fell again to 20° C. The night temperature was on the whole low, light frosts were even experienced at the beginning of June in several areas of Sub-Carpathian Russia.

The rainfall was above the average throughout the greater part of the country. Generally speaking, weather conditions were favourable to cereals

Young wheat was growing well. On June 4 early sowings were sprouting in many departments and flowering had commenced in some of the warm districts. The growth of late sowings was less satisfactory, and they are thin, short and yellowed in the lowlands owing to the large quantities of moisture. Some attacks of rust have been notified from the department of Pest.

On June 4 forecasts concerning the wheat crop in 9 departments were good, while an average harvest was anticipated in four others, in the 21 other departments it is expected that the crop will be below the average.

In the areas where the soil is good and well cultivated rye is long in the straw and tufted, but is thin in other soils. The rainy weather was unfavourable to flowering. Estimates made on June 4 forecast a rye crop above the average in 9 departments and an average yield, if not below the average, in the remaining 25 departments.

Most of the sowings of winter barley were destroyed by frost, while the surviving plants are, generally speaking, thin and low. The winter barley crop is expected to be below the average. Spring barley appears on the whole to be growing well, but more heat is needed.

Winter oats were also destroyed throughout the greater part of the country. Spring oats are growing under generally satisfactory conditions

(Telegram of June 25): The warm weather during the period of the two weeks ending June 22 has favoured the growth of the crops, but was unfavourable to their flowering. Floods also caused damage. At the present time, a harvest under the average for wheat and particularly for rye is forecast, while those for spring barley and oats are expected to be above the average.

Italy: The cereal season which is now drawing to a close has not been altogether satisfactory. In some districts the autumn rains were too abundant, the winter was exceptionally severe and growth was in many cases retarded. The favourable condi-

tions which prevailed in the spring, however, have led to a rapid recovery and crops have grown well. Constant care and abundant manuring have contributed to the success of the wheat crop, which is expected to be as abundant as that of 1939.

Lithuania: During the month of May weather conditions were relatively dry and during some days cold. Violent winds dried the soil. Night frosts were reported, but no damage resulted. During the second half of the month there were some rains and temperatures were lightly higher. On the whole weather conditions were unfavourable to standing crops. Winter wheat vegetation start has been good, but early in June crop condition was not very good. Winter rye condition is excellent in the lowlands but unsatisfactory in the hill districts. Conditions prevailing during May were favourable to the preparatory work for sowing spring cereals. Cold weather and heavy winds retarded spring sowings and the vegetation too was hindered by cold and lack of moisture. Crop condition of winter wheat as at June 1 was estimated 2.4 (80.0) compared with 2.6 (86.6) at May 1, 1940 and 3.1 (103.3) at June 1, 1939. The corresponding figures for winter rye were 3.3 (110.0), 3.0 (100) and 3.5 (116.6).

Romania: During the two weeks from May 30 to June 12, the weather was rather wet and cold. Agricultural work was hampered by the rains. Severe inundations are reported, chiefly in the valleys of the Danube (Oltenia) and the Jalomita. In 6 Departments, crops were more or less destroyed.

About June 12, however the condition of the winter cereal crops was considered satisfactory; at that date, the greater part of winter wheat and barley had eared. Sporadic attacks of yellow rust on winter wheat crops were reported.

An increase in area under spring crops as compared with the previous years is expected. These crops are in good condition.

Areas sown to cereals.

COUNTRIES	1940		1939		Average 1934 to 1938		% 1940		1940		1939		Average 1934 to 1938		% 1940	
	ooo acres						= 100		= 100		ooo acres				= 100	
WHEAT																
Greece	2,577	2,320	2,059	111.1	125.2	161	155	173	103.6	93.0						
Lithuania . . . w)	346	364	381	94.9	90.7	1,248	1,222	1,246	102.2	100.1						
Luxembourg . . . w)	35	38	45	91.1	76.2	16	18	18	89.8	89.2						
Romania w)	7,798	9,558	7,809	81.6	99.9	853	1,086	1,015	78.5	84.0						
Canada { w) 1) 711 2) 735 2) 590				96.7	120.5	1) 738 2) 891 2) 565			82.8	130.7						
United States . . . { s) 3) 27,535 26,021 24,451				105.8	112.6	3) 209 211 168			99.1	124.2						
India (4)	33,666	34,941	34,585	96.4	97.3	—	—	—	—	—						
Egypt	1,560	1,501	1,452	103.9	107.4	—	—	—	—	—						
BARLEY																
Greece	538	518	517	103.8	104.1	420	326	343	128.6	122.4						
Romania w)	226	256	196	88.1	115.2	—	—	—	—	—						
Canada 3) 4,484		4,347	4,144	103.1	108.2	3) 12,880	12,790	13,435	100.7	95.9						
United States . . . 3) 14,606		14,546	11,912	100.4	122.6	3) 35,818	35,512	38,421	100.9	93.2						
Egypte	272	273	280	99.7	97.0	—	—	—	—	—						
OATS																

w) Winter crops. — s) Spring crops. — 1) Area indicated for harvest. — 2) Area harvested. — 3) Farmers' intentions to plant. — 4) Fourth estimate.

Sweden: According to the system adopted in the country, crop conditions were as follows on June as compared with the situation on the same date in 1939 (figures in parenthesis represent the system adopted by the Institute):

Winter wheat.	1.9 and 3.4 (69 and 112)
Winter rye.	2.7 and 3.0 (93 and 100)

Switzerland: Crop condition of autumn cereals differed considerably from one region to another at the beginning of June. On the whole the crops are still thin, partly because autumn field work was carried out under adverse conditions and partly because the unfavourable weather during the winter and spring did further damage to the sowings. Thickly grown fields are the exception. In spite of all that has been done, the autumn wheat crop has not yet entirely recovered from the damage suffered during the winter. Crops are thin with empty spaces in the fields; the winter season has seldom affected sowings so severely. The rye crop is in little better condition, having also suffered severely from the bad winter, especially where the soil is moist and heavy. The only satisfactory fields are those where the soil is suited to rye and where sowings were carried out in time.

Crop condition of autumn barley is fairly good in certain districts, while in others the fields have suffered from the severe winter.

The rain which fell at the end of May came at the right time for spring cereals and sowings went forward under good conditions. The fields which were sown early are on the whole somewhat thin, however, and their condition is considered to be worse than it was a month ago. This may be due to the use of poor seed with an unsatisfactory power of germination. If weather conditions remain favourable, however, it is still hoped that the harvest may be good.

The following is a table of crop conditions prepared, according to the system in use in the country, on a basis of an abundant crop = 100

	I VI 1940	I-V 1940	I VI 1939
Autumn wheat	61	61	81
Spring wheat	72	77	76
Autumn rye	67	65	79
Spring rye	70	77	80
Autumn barley	64	67	83
Spring barley	74	77	74
Oats	77	80	78
Meslin	66	65	84
Spelt	67	66	84

Yugoslavia: Cloudy and rather rainy weather prevailed throughout the first ten days of May, after an interval of better weather at the beginning of the second ten days, conditions remained dull and rainy till the end of that period. The weather was fine, calm and sunny throughout the remaining ten days of the month. Although the temperature was not very high throughout May it began to rise rapidly towards the end of the month. Generally speaking, weather conditions led to a slight improvement in crop condition among the cereals, which had suffered from the severe winter, and from the cold and floods which characterized the spring.

According to information received from unofficial sources, the area sown to winter wheat during last autumn was about 500,000 acres less than the area sown to this crop last year. The spring floods also destroyed some 250,000 acres sown to wheat.

Condition of the wheat crop was considered as satisfactory at the close of May, and the harvest is expected to fall only slightly short of the average for the past ten years. It is expected that the operations of harvesting and getting in the crop will be considerably delayed.

U. R. S. S.: During the sowing period the Commissariat for Agriculture reports regularly every five days the figures showing sown areas, giving also the corresponding figures for the preceding year and the respective percentages of the execution of the Plan. While for a certain number of crops, such as cotton, flax, sugar beet, etc. the figures are given separately for each crop, for cereals, on the other hand, the data refer to all spring cereals and only for the group of collective holdings (kolkhozy). However, an indirect indication of the execution of the sowing Plan for spring cereals can be found in the data referring to all spring crops. According to these data, the sowing of all spring crops on collective and State holdings, here considered together, which cover almost the whole cultivated area of the country, individual enterprises being very limited in number, were practically finished by June 5. In fact, on the above-mentioned date the sown area on collective holdings had reached 204,720,000 acres, that is to say 99 per cent. as against 203,205,000 acres, or 100 per cent. of the Plan on the same date last year. For collective holdings the respective figures are as follows: 187,446,000 and 188,191,000 acres and the same percentages, that is 99 per cent. and 100 per cent. These data lead to the belief that the Plan for the sowing of spring cereals was almost wholly carried out.

The beginning of the sowings of cereals on collective holdings was considerably retarded as compared to last year, owing to unfavourable weather conditions, but towards the end of April the delay had been compensated for and the sowings were carried out with almost the same rhythm as in the preceding year.

Area sown to cereals on collective holdings.

Dates	1940 1,000 acres	1939
30 April	60,200	60,300
5 May	74,000	75,000
10 "	88,500	87,800
15 "	99,400	98,400
20 "	107,400	99,400
25 "	112,500	113,600
31 "	115,100	116,800
5 June	116,800	118,300

There are no data available for the areas sown to individual cereals, but in many regions, according to information appearing in the Soviet press, a tendency is noted towards the extension of areas sown in the spring to wheat, oats and barley, substituting cereals of secondary importance such as millet, buckwheat, and in some zones even maize.

With regard to the area sown in the autumn of 1939 to winter cereals, there is only a round figure for the Kolkhozy of 83,320,000 acres. The average area sown to winter cereals on that class of holdings during the five years 1933-34 to 1937-38 represents 86 per cent. of the total for all classes of holding in the Soviet Union. In the autumn of 1937 the areas sown to rye and winter wheat were respectively 49,288,000 and 32,339,000 acres.

At the beginning of the spring, weather conditions were favourable to the growth of cereals. The abundant falls of snow made up for the lack of moisture in the soil, noted in the autumn in the majority of the south-eastern and central regions. Almost all the soil was furnished with a sufficient quantity of water for a normal development of vegetation. The winter seedlings wintered well in the majority of regions with the exception of the southern part of Ukraina.

The frequent return of cold periods has had an unfavourable effect on the development of seedlings. In some central regions and in a part of the south-east, however, there has been no rain during the sowing periods. The reserves of water accumulated during the winter have counteracted the influence of the drought, but in the provinces of Moscow, Tambov, Riazan, Jaroslav, Orel, and in some other regions, the seedlings have felt the effects of the drought.

Recently the condition of the seedlings has been improved thanks to the rain which fell most heavily the third decade of May and at the beginning of June, in the majority of the southern, western and eastern regions of the European territory. At the end of May almost all the regions, with the exception of the central regions and Saratov, had good soil moisture reserves.

The situation of cereals on June 1 was as follows: *winter rye* in the central regions was in the ear-formation stage and in the southern part of Ukraina in the flowering stage, developing under favourable conditions.

Winter wheat was in the ear-formation stage in the Caucasus, in the Crimea and in the southern part of Ukraina, and its prospects were generally considered to be good. *Spring wheat* was in the ear-formation stage in the southern part of Ukraina and in North Caucasus and the condition of the crop was good in all regions and also in the central regions where wheat was in the stalk stage. In some regions of the central zone, the condition of the cereal crops, following cold weather and insufficient rainfall was generally satisfactory, and only in some localities was it not satisfactory.

In the Asiatic territory of the Union, the condition of the winter rye crop was generally good, in Siberia, and that of winter and spring wheat varied from good to excellent in the Republics of Central Asia.

Argentina: Preparatory field work and ploughing for the approaching cereal sowings went forward under good conditions during May

Canada: According to a cable received on May 29 from the Canadian Government, quite favourable conditions for the start of the 1940 grain crops prevailed in central and southern Manitoba, southwestern and westcentral Saskatchewan and over most of Alberta. Rainy weather in Alberta in early spring delayed seeding but during the latter part of May warmer weather and ideal moisture conditions brought crops along rapidly. In northern Manitoba, central and northern Saskatchewan and a small portion of northeastern Alberta moisture conditions were very poor and generous rains were needed during the summer to ensure crops in these sections. While slight damage from soil drifting was reported from several districts, there has been little damage from insects. Grasshoppers were hatching in southern Saskatchewan and parts of southern Alberta but control measures were being taken where they were considered necessary. Little damage from wireworms occurred. About three quarters of the coarse grain acreage was seeded and all the crop was expected to be in the ground by June 4.

According to a cable received on June 5, seeding was completed on the Prairies. Crop prospects were very favourable over the southern part of Manitoba, southern and western Saskatchewan and most of Alberta, but rains were urgently needed in northern Manitoba and central and northern Saskatchewan.

A further cable received on June 8 reported the condition of crops on May 31, expressed as a percentage of the longtime average yield, as follows: Spring wheat 96, winter wheat 98, all wheat 96, oats 92, barley 91, winter rye 88, spring rye 93, all rye 89, mixed grains 92. The corresponding figures for the same date last year were as follows: spring wheat 94, winter wheat 98, all wheat 94, oats 93, barley 93, winter rye 85, spring rye 95, all rye 87, mixed grains 93.

United States: During the week ending May 22 conditions were mostly favourable except for low temperatures in a large area of the interior and also for drought conditions. Conditions were generally favourable for wheat with spring wheat seeding practically completed. During the following week unseasonably cool weather continued to be general from the Rocky Mountains eastward with rain needed in South Dakota, Nebraska and the eastern Great Basin. Small grain crops were developing satisfactorily in most parts of the eastern section with spring wheat condition favourable except in dry areas.

On June 1, crop condition of spring wheat was estimated at 88 per cent of normal as compared with 71 per cent last year. Crop condition of barley and oats was 82 per cent as compared with 72 per cent. last year.

The third estimate of winter wheat production, based on crop condition on June 1, shows an increase of about 17 ½ million centals (29 million bushels) over the previous estimate referring to May 1, it is 293,315,000 centals (488,858,000 bushels) as compared with 338,059,000 (563,431,000) in 1939 and with 335,654,000 (559,423,000) on the average 1934 to 1938. Percentages 86.8 and 87.4.

The second estimate of rye production, calculated on the same basis, shows an increase of about 1.2 million centals (2.2 million bushels) over the previous estimate referring to May 1, it is 21,638,000 centals (38,640,000 bushels) as compared with 21,979,000 (39,249,000) in 1939 and with 23,115,000 (41,276,000) on the average 1934 to 1938. Percentages 98.4 and 93.6.

The week ending June 5 was featured by high temperatures in the northwest, below normal warmth in the southeast and rather general rains in the east. Moisture conditions were favourable in the southwest and northwest. The winter wheat crop was developing favourably in most parts and the condition of the spring wheat crop was satisfactory.

During the week ending June 12 the weather was warmer, well distributed rains favoured crops, chiefly wheat, except in the north-west where low temperatures continued.

Low temperatures were experienced in the south-western areas during the week ending June 19, but a nearly ideal weather prevailed in the eastern section of the country, resulting in a rapid growth of the crops. Crop condition of the winter wheat continued to be favourable, and good to excellent outlook was maintained for most spring wheat crops.

(Telegram of June 27): During the week ending June 25 crop prospects were generally satisfactory despite variable weather. Harvesting of winter wheat was delayed by showers in some areas but elsewhere good advance was reported. Rains benefited spring wheat generally but were too late in some sections.

India: Toward the end of May crop condition was reported to be fairly good on the whole. In the Punjab the weather has been dry except for light showers in parts. Crops were in average to good condition in irrigated areas and under average to average in unirrigated areas. In the Central Provinces the weather was hot and the sky cloudy.

Japan. Weather conditions were normal during the past month and the growth of winter wheat and barley was satisfactory. Field work for spring sowings was carried

out as usual and the sowings themselves were completed at the right time and under normal conditions.

Palestine: During the first half of May weather conditions continued normally seasonable. During March and April good rains well distributed throughout the country were reported. Grain crops have wintered in excellent conditions and on May 1 no losses from fungoid diseases were reported, but only very small attacks by insect pests. Sowings of spring cereals have been completed under good conditions.

Algeria: Towards the end of May the condition of the crops did not change in spite of the welcome rainfall of the preceding week. In some regions where the rainfall was not sufficient, scalding is reported. The situation is irregular on the whole. Numerous flocks of sparrows have caused considerable damage to the barley and early wheat crops, especially in the Perregaux region.

Egypt: At the beginning of June crop condition of wheat was estimated at 104, as against 101 on May 1 and 106 on June 1 1939. The corresponding figures for the barley crop were respectively 104, 102 and 104.

CURRENT INFORMATION ON MAIZE.

Hungary. Maize sowings were complete about June 4. In many districts early sowings have sprouted irregularly owing to the bad quality of seed used, and new sowings have often had to be made. Consequently the crop in certain areas is coming up very thin and growth is irregular. Owing to the cold, rainy weather some of the maize fields are yellowed. Late sowings are growing well, however, although warmer weather is required.

Italy. The "Federazione italiana dei Consorzi agrari" states that the yield of the maize crop will probably be considerably greater this season than in 1939. The normal annual yield in Italy is some 77 million centals (138 million bushels) which is considered as sufficient to meet the country's demand (human consumption, feeding stuff for various stock, sowings).

Romania: Until June 12, the area sown to maize was officially estimated at 12 million acres. Crop condition was not favourable the weather being cold and rains frequent and abundant.

Yugoslavia. Sowings have been seriously affected by the cold and very damp spring, as also the normal growth of maize in the chief producing areas. Due to the prolonged floods in several districts, new sowings of maize had to be made. The wet weather which continued throughout May, except during the last ten days, affected the growth of the crop unfavourably.

U. S. S. R.: According to the plan it is estimated that 5,328,000 acres will be sown under maize during this year. During the five-year period of 1934-1938 the average acreage sown to maize was 7,220,000 acres. Against this average the area foresown for the current year is less than 26 per cent. During the five-year period of 1933-1937 the yield per acre was 10 centals (17 bushels).

Argentina: According to the second official estimate, maize production in 1939-40 amounts to 234,573,000 centals (418,881,000 bushels). This new figure shows a decrease of 8,819,000 centals (15,747,000 bushels) on the mid-April estimate, but still represents an exceptionally large crop inferior only to the record of 253,092,000 centals (451,950,000 bushels) in 1934-35 and about equal to the 1930-31 outturn. The new estimate is respectively 118.7 per cent. and 29.4 per cent. larger than the final

estimates for 1938-39, 107,233,000 centals (191,488,000 bushels) and the preceding five-year average, 181,315,000 centals (323,777,000 bushels). This year's crop is obtained from a sown area of 17,800,000 acres, which is the largest yet sown, with the exception of the record of 1935-36 exceeding the 1938-39 area by 35.8 per cent. and the previous five-year average by 7.6 per cent. The size of this year's crop is due also to the very favourable season, which was marked by heavy and well distributed rains in the principal maize regions and by sunny weather during maturation.

United States: During the week ending May 22 maize planting advanced but warmth was needed for germination and growth. During the following week planting was generally retarded by rain except in Iowa. Cool weather delayed maize planting in the north eastern belt during the week ending June 5, but during the following week planting progressed and towards the middle of June it was nearly completed. During the week ending June 19 maize growth was rapid but cultivation was hindered by rains in some areas.

(Telegram of June 27): During the past week weather was variable. Crop conditions were generally favourable for corn and prospects satisfactory.

Netherlands Indies: J a v a a n d M a d u r a . — The Department of Agricultural Statistics of the Central Statistical Office communicates the following details on the maize area:—

	1940 acres	1939 acres
Area harvested in March.	557,700	439,400
Area harvested from January 1 to March 31.	2,321,600	2,375,200
Area of standing crops at the end of March.	790,000	683,000

Tanganyika: Weather conditions during April were satisfactory, with well distributed rains, except in the Eastern and Southern Provinces where dry conditions were experienced during the first part of the month and were followed by heavy rains which in some cases originated severe floods.

It was reported that good crops of short rain maize had been harvested in many areas. Planting of long rain maize was in progress, especially in the Northern and Tanga Provinces where large areas had already been planted.

Union of South Africa: Toward the end of May unofficial estimates placed the maize crop at 20,000,000 bags of 200 lb. (71,429,000 bushels) compared with the earlier official forecast of 20,109,000 bags (71,818,000 bushels). The final figure for last year is 29,103,000 bags (103,939,000 bushels) and the average of the five preceding years is 21,009,000 bags (75,032,000 bushels); percentages: 68.7 and 95.2. The imposition of the levy of 2s. 6d. a bag on maize and maize products bought from producers was gazetted on May 8 but the market was inactive pending the introduction of the full scheme for marketing the current crop. It is reported that the new scheme is based on the export of about 4,000,000 bags (14,300,000 bushels) and is intended to stabilise the return of 8s. per bag to producers plus a supplementary payment of 1s. 6d. per bag in respect of the first 500 bags, while consumers will pay about 10s. 6d. per bag.

CURRENT INFORMATION ON RICE.

Italy: According to official estimates this year's rice crop will be larger than the 1939 yield. Weather conditions have on the whole been favourable and the area sown to rice is larger than it was last year.

Argentina: The production of rice in 1939-40 is estimated at 2,271,000 centals (5,046,000 bushels) against 2,291,000 (5,092,000) in 1938-39 and an average of 746,000 (1,658,000) in 1933-34 to 1937-38; percentages, 99.1 and 304.3.

Taiwan: The rice crop was growing satisfactorily under suitable weather conditions.

India: Toward the end of May crop conditions was reported to be fairly good on the whole. In Bengal rainfall was generally light to moderate, though it was heavy in places. Sowing was being completed in east and north Bengal. In Bihar light rain has fallen. In Orissa, where a moderate amount of rain has fallen, the harvesting of *dalu* paddy was being completed. In Assam the weather was seasonable and crop prospects were fair. In the Central Provinces the weather was hot and the sky cloudy; crops were progressing. In Madras, where sowing was proceeding, there was heavy rainfall in Coimbatore and fair in the Carnatic; the crops were in fair condition.

Netherlands Indies Java and Madura. — The Department of Agricultural Statistics of the Central Statistical Office communicates the following details on the rice area —

	1940 acres	1939 acres
<i>Area harvested in March —</i>		
Wet padi	485,800	473,200
Dry padi	285,900	253,800
<i>Area harvested from January 1 to March 31 —</i>		
Wet padi	854,800	792,200
Dry padi	367,700	329,900
<i>Area of standing crops of the end of March. —</i>		
Wet padi	6,641,300	6,727,500
Dry padi	520,400	588,100

Tanganyika: It was reported in April that prospects for the rice crop were very good in the Lake, Western, Northern and Tanga Provinces, while in the Central and Southern Highlands Provinces as well as in some parts of the Eastern and Southern Provinces the crop was stated to have suffered from severe floods.

CURRENT INFORMATION ON POTATOES.

Hungary: Potatoes were growing well about June 4. The early varieties have commenced to flower and their foliage is abundant. The first weeding is in progress. The late varieties have sprouted satisfactorily and are growing well but more heat is required.

Italy: This year a larger area has been sown to potatoes than last year. Weather conditions have been favourable and official forecasts estimate that this season's crop will be more abundant than that of 1939.

Romania: An increase of the acreage under potato cultivation against the preceding year is being forecast officially.

Switzerland: Planting went forward under good conditions. Lifting took place as usual and up to the present the crop has not suffered from weather conditions. Early potatoes are well forward and promising. The lifting of the later varieties was also satisfactory. The high proportion of new sowings, the satisfactory state of the soil and the favourable weather experienced up to the present, have all contributed to the creation of conditions which have seldom been so favourable to the production of a good crop.

Crop condition at the beginning of June was quoted, according to the system adopted in the country, at 78, as against 64 on May 1, 1940 and 66 on June 1, 1939.

U. S. S. R.: In kolkhozi, which normally represent about one half of the potato area in the Union, 6,548,000 acres, or 74 per cent. of the Plan, had been sown on May 31 against 6,811,000 acres, or 82 per cent., at the same date last year.

GENERAL REVIEW OF THE SUGAR-BEET CROP AND SUGAR PRODUCTION

It is particularly difficult to collect at the present time sufficient information regarding sugar-beet in Europe. All the belligerent States refrain from publishing statistical data or letting out information on the condition of crops. Many neu-

Acreege of Sugar-beet.

COUNTRIES	1940 *	1939	Average 1934 to 1938	% 1940	
				1939 = 100	Average = 100
Germany	(1) 2,000,000	1,402,331	1,110,570	—	—
Belgium	133,500	134,168	117,364	99	114
Bohemia-Moravia	(1) 351,000	(1) 280,890	362,766	125	110
Slovakia	47,000	36,300		137	223
Bulgaria	40,000	28,786	17,713	115	108
Denmark	109,000	94,600	100,282	100	58
Spain	(1) 120,000	(1) 120,000	212,299	56	94
Finland	8,150	14,460	8,664	107	114
France	670,000	621,015	585,856	101	—
Hungary	131,000	129,780	97,420	156	117
Ireland	65,000	41,660	55,429	111	159
Italy	408,000	368,313	256,870	184	181
Latvia	62,000	33,660	34,101	141	176
Lithuania	30,900	21,890	17,569	106	115
Netherlands	119,800	112,934	104,411	—	—
Poland	—	406,500	320,886	105	155
Romania	137,800	131,872	89,120	100	97
United Kingdom	350,000	344,400	354,970	108	106
Sweden	136,000	125,413	127,817	94	169
Switzerland	8,400	8,900	4,964	130	253
Yugoslavia	150,000	114,000	58,691		
Total Europe (a) . . .	5,077,550	4,571,872	4,037,762	110	125
U. S. S. R.	2,940,000	2,928,000	2,958,142	100	99
Total Europe (b) . . .	8,017,550	7,499,872	6,995,904	106	114
Canada . . . . .	...	58,600	47,514	...	...
United States . . . . .	...	917,000	798,058	...	...
Total North America . . .	...	975,600	845,572	...	...
Japan	46,500	48,446	42,481	96	109
Manchukuo . . . . .	...	54,000	38,885	...	...
Turkey	91,000	91,000	63,213	100	145
Total Asia . . .	...	193,446	144,579	...	...
TOTALS . . . { a)	...	5,740,918	5,027,913	...	...
{ b)	...	8,668,918	7,986,055	...	...

* Approximate data. — (a) Not including U. S. S. R. — (b) Including U. S. S. R. — (1) Licht's estimate. — (2) Average of two years.

tral States are acting on the same line. Even the International Association for Sugar Statistics which every year in June undertakes the first inquiry as to the area under sugar-beet, has been able to obtain data for the current year only for Denmark, Latvia, the Netherlands, Sweden, Switzerland and Slovakia.

However, according to information received from official and reliable private sources, it can be asserted that in the more northern regions of Europe the

Production of Cane-Sugar.

COUNTRIES	1939-40 (1)	1938-39	Average of 1933-34 to 1937-38	1939-40 (1)	1938-39	Average of 1933-34 to 1937-38	% 1939-40	
							1938 39	Average
							= 100	= 100
	ooo centsals			short tons				
AMERICA.								
Antigua	304	493	514	15,200	24,640	25,688	62	59
Argentina	11,442	10,244	8,147	572,000	512,190	407,341	112	140
Barbados	2,228	3,502	2,517	111,391	175,114	125,850	64	88
Brazil	26,235	24,251	23,161	1,310,000	1,200,000	1,158,050	108	113
Cuba	62,567	61,730	57,752	3,128,000	3,100,000	2,887,585	101	108
Ecuador	441	483	413	20,000	24,100	20,657	91	107
United States (La & Fl)	10,140	11,660	7,196	507,000	583,000	359,800	87	141
British Guiana	4,299	4,239	3,978	215,000	211,954	198,899	101	108
Surinam	245	270	378	12,240	13,499	16,895	91	65
Jamaica	2,538	2,642	2,086	126,900	132,100	104,287	97	122
Martinique	1,323	1,433	1,104	70,000	72,000	55,206	92	120
Mexico	6,834	7,772	6,037	340,000	388,602	301,854	88	113
Peru	8,686	8,157	8,702	434,000	410,000	435,102	106	100
Puerto Rico	22,046	17,042	18,515	1,000,000	852,000	925,750	129	119
Dominican Republic . .	9,921	9,502	9,030	500,000	475,000	451,494	104	110
St Kitts	626	836	659	31,300	41,816	32,944	75	95
St Lucia	220	180	168	11,000	9,016	8,424	122	130
Trinidad	2,866	2,877	2,983	140,000	143,870	149,129	100	96
Venezuela	529	540	489	26,000	27,000	24,472	98	108
Total America	173,490	167,853	153,829	8,570,031	8,395,901	7,691,410	103	113
ASIA.								
Taiwan	26,630	33,671	19,895	1,331,500	1,683,500	994,719	79	134
India	61,112	55,213	59,190	3,056,000	2,760,600	2,959,455	111	103
Japan	3,386	3,596	2,359	169,300	179,800	117,951	94	144
Java	34,172	34,392	19,839	1,710,000	1,720,000	991,927	99	172
Philippines	24,912	22,708	23,455	1,230,000	1,140,000	1,172,739	110	106
Total Asia	150,212	149,580	124,738	7,516,800	7,483,900	6,236,791	100	120
AFRICA.								
Egypt	3,524	3,573	3,179	176,200	178,634	158,951	99	111
Mauritius	5,059	7,084	5,886	252,930	354,180	294,310	71	86
Reunion	1,622	1,890	1,745	81,100	94,505	87,267	86	93
Union of South Africa	11,623	11,616	9,426	581,100	580,800	471,280	100	123
Total Africa	21,828	24,163	20,236	1,091,330	1,208,119	1,011,808	90	108
OCEANIA.								
Australia	20,172	18,437	15,933	1,009,000	921,900	796,647	109	127
Hawaii	19,048	19,401	18,961	952,000	970,000	948,051	98	100
Fiji Islands	2,657	2,654	2,912	132,800	132,700	145,602	100	91
Total Oceania	41,877	40,492	37,806	2,093,800	2,024,600	1,890,300	103	111
TOTALS	387,407	382,088	336,609	19,271,961	19,112,520	16,830,309	101	115

(1) Approximate data.

sugar-beet vegetation is slightly backward not only on account of rather late sowing, but owing to cold weather prevailing during the time of the growth of the crop, which exerted a retarding effect until the first decade in June. During the same period moisture was excessive and cold retarded the development of the plants. In the central regions of Europe a certain delay in the growth of sugar beet can be noted, although it is less marked than in regions farther north. Rains were frequent, but less abundant and very irregular, causing floods in some regions while in others droughts were registered on account of rare or no rain. In the southern regions crop conditions are better. In this zone the season has also been rather cold, but instead of causing a general retarding effect, the cold has caused a slower, more gradual and uniform growth so that the crops show a thicker and more regular foliage of good colour.

Throughout Europe, until mid-June, the drought-stricken regions excepted, water reserves in the soil were sufficiently abundant for the needs of the vegetation.

Work on the land has progressed everywhere in time, and in the more southerly European districts weeding has been completed.

The table for cane-sugar production has been put up to-date together with the data contained in the questionnaire forwarded to certain States by this Institute for the Statistical Yearbook 1939-40 about to be published.

According to the most recent data the total cane-sugar production for 1939-40 is practically equal to the 1938-39 crop. If we add the beet-sugar production to the figures of cane-sugar already published last March, we obtain a world sugar production which not only exceeds by 4 per cent that of the year 1938-39, but which is also the highest for the last years.

CURRENT INFORMATION ON SUGAR.

Hungary Sugar beets sprouted well and were growing satisfactorily about June 4. The foliage is abundant and healthy. The first weeding is in progress.

Switzerland Sugar beets are still somewhat backward, the ground having been too dry at certain times. If weather conditions remain favourable, however, it seems as though a good crop might be expected.

Crop condition of sugar beets was quoted at 77 on June 1, as against 76 on May 1, 1940 and 77 on June 1, 1939.

U. S. S. R.: Owing to the bad weather conditions, it was impossible to carry out normal and continuous seasonal work in the fields in the Soviet Union this year; consequently sugar beet sowings were seriously retarded, taking longer than last year, as will be seen from the following table showing areas sown to sugar beet on collective farms in 1939 and 1940 and the percentage of the whole area as established under the Plan.

Area sown to sugar beet on collective farms.

Date	1940 acres	% of plan	1939 acres	% of plan
30 April	923,200	33	2,571,700	93
5 May	1,831,300	66	2,676,900	97
10 "	2,603,300	93	2,746,400	99
15 "	2,738,200	98	2,762,200	99.6
20 "	2,772,800	99	2,765,900	99.7
25 "	2,782,000	99.7	2,769,400	100
31 "	2,784,400	99.8	2,769,400	100

Sugar beet sowings were almost complete on the collective farms by May 15 and the area sown was the same as in 1939. As this represents almost all the sugar beet crop grown in the Union (95 per cent. in 1938), it may therefore be said that the total area sown to sugar beet in 1940 did not differ much from the 1939 area.

Rain fell almost everywhere in the principal sugar beet producing districts throughout the second and third ten days in May, but the cold retarded the development of the plants and shortened their period of growth.

The weather was warm and rainy at the beginning of June and the soil retained sufficient moisture almost everywhere.

In several provinces and especially in Kiev, Poltava, Kharkov, Tchernizov, Sumy, Kursk and others, a widespread invasion of the *Cleonus punctivermis* has been observed; in some cases the seeds have been so severely damaged by this insect that it has been found necessary to make new sowings.

Barbados: The rainfall for March was appreciably above the average, heavy rains falling in the first week. This served to arrest drying out of cane, which had become evident by the end of February, and at the same time to develop the young plant cane and ratoon stools. Although cane tonnages reported were very much what had been estimated by the Department, the juice, however, of the crop being reaped had at no time reached the quality expected, due probably to forced ripening in the very dry months of January and February. This has led to a drop in the estimate of the crop, as it may be seen in the general table.

Taiwan: Sugar cane was growing satisfactorily on the new as well as on the older plantations.

India: Toward the end of May in Bihar the crop condition of sugar cane was fair to good. By the middle of May the crushing of sugar cane was complete. In Orissa the crop was thriving.

Egypt: At the beginning of June the condition of the new sugar cane crop was normal.

CURRENT INFORMATION ON VINES.

France: The last week of May was characterised in the South of France by almost continuous bad weather: rain, violent winds, storms, and the first spots of mildew have appeared. It is feared that if the disease should spread rapidly, rapid contagion could not be checked owing to insufficient supplies of copper sulphate. Then too, the wind

has prevented the carrying out of all the sulphur spraying necessary to prevent oidium (vine-mildew). (*Revue de Viticulture*).

Greece: The exceptionally heavy and frequent rains which occurred during the week from May 16 to 23 throughout almost the whole extent of the country, besides flooding the vines in several localities, have carried away almost all the spraying mixture and an immediate invasion of mildew is now threatened.

Hungary: The uncertain weather which prevailed during the last week in May and the first week in June retarded the growth of vines. Information has been received of several attacks of mildew and of damage done by hail.

Romania: Towards mid-June conditions of vine growing were bad. In several regions the cultures have been affected by mildew disease. In anticipation of a poor harvest price for the old wine is high.

Switzerland: Damage done to the vineyards by the severe winter is very variable but on the whole is not so serious as had been expected. The formation of clusters took place somewhat irregularly and their numbers vary considerably according to the exposure of the vineyards and the damage caused during the winter. Grapes are growing well, however, and the shoots are strong and healthy. It may be said that disease has not as yet made its appearance, any manifestations being negligible.

On the basis of the system adopted in the country, crop condition was quoted on June 1 at 64 as compared with 68 on the same date in 1939.

Yugoslavia: The growth of vines suffered from unfavourable weather conditions during May. In several districts this year's grape yield is expected to be lower than that of last year.

Algeria: Preventive anticryptogamic treatments were carried out. Up to the end of May no invasion had been reported with the exception of endemic disease in some centres of Sahel. In the backward zones flowering was still in progress. At the beginning of June the vegetation of the vines was very active and the vineyards looked promising. An abundant and early harvest was expected, larger than normal.

Egypt: According to the latest information the area in bearing of specialised vines for selected table grapes at the end of 1939 was estimated at more than 7,600 acres, compared with 7,400 in 1938 and with an average of 6,800 acres during the five years 1933-37. Percentages: 102.8 and 112.1. The corresponding production figures were 582,200 centals of fresh grapes in 1939, 500,200 in 1938 and an average of 481,100 centals during the preceding five years. Percentages: 116.4 and 121.0.

CURRENT INFORMATION ON FLAX.

Hungary: Spring flax was growing thickly and regularly about June 4. In some places the crop is suffering from an invasion of weeds. In some places early sowings had commenced to flower.

Italy: The flax crop was developing regularly at the end of May and its condition was satisfactory. Damage by disease and insects was variable but on the whole of slight importance.

Romania: An increase of area under flax is being forecasted officially as against preceding years.

U. S. S. R.: As demonstrated in the following table sowing of flax for fibre (variety "Dolgunez") has started much later than in 1939. In fact, even on May 5, 1940, only 31 per cent. of the Sowing-Plan, has been carried out as compared with 40 per cent. at the same date of last year. The delay has been caused by unfavourable atmospheric conditions. But later on, the sowing campaign was speeded up and the time lost was recovered and the dates for 1939 even surpassed. On May 31, 1940 98 per cent. of the Sowing Plan had been carried out, so that it could be considered as being practically terminated. At the beginning of June no sowing was being done, except in a few northern zones of the Union.

*Areas sown to flax for the production of fibre (variety "Dolgunez")
in collective holdings.*

Dates	1940		1939	
	acres	% of the Plan	acres	% of the Plan
30 April	628,000	14	1,271,000	28
5 May	1,382,000	31	1,752,000	40
10 "	2,651,000	60	2,280,000	52
15 "	3,599,000	81	2,898,000	65
20 "	4,044,000	91	3,671,000	83
25 "	4,238,000	95	4,073,000	92
31 "	4,344,000	98	4,280,000	97

The areas sown mentioned in the table refer to collective holdings which cultivate almost the total quantity of flax for fibre produced in the Union (in 1938 it represented 99 per cent. of the total flax area of the Union).

If, in 1940, the sowing Plan is carried out fully, the area under flax for fibre will cover 4,433,000 acres, that is very little more than the figures for 1939, but very much below the average of area under flax during the five-year period 1934 to 1938, which constituted 5,098,000 acres.

CURRENT INFORMATION ON COTTON.

Greece: Weather conditions during April made it possible to proceed with cotton sowings throughout the country and especially in Attica and Boeotia, where 80 per cent. of the area sown to cotton in Greece is situated. It is estimated that the area sown to cotton this season will amount to some 222,000 acres, or 20 per cent more than last year. The somewhat rainy weather experienced in May was on the whole favourable to the growth of the crop.

Romania: An increase of the cotton acreage as compared with the two last years is being forecast officially.

Yugoslavia: Due to the difficulty encountered in obtaining supplies of cotton from abroad, the Yugoslav Government has adopted a series of measures for increasing the area sown to cotton during the current year.

U. S. S. R.: The cotton sowing campaign is marked by two stages of development: (1) since the start to April 25 when it progressed more rapidly than in 1939; (2) during the two following weeks it went on slower. However, on May 20 the sowing was practically completed almost everywhere. The slackening was the result of adverse meteorological conditions which prevailed in several zones during this period.

The following table demonstrates the sowing campaign from April 25 to May 31, during the years 1940 and 1939, indicating the areas sown not only in acres but also in per cent of area as forecast by the sowing Plan.

Area sown to cotton in collective holdings.

Dates	1940		1939	
	1000 acres	% of the Plan	1000 acres	% of the Plan
25 April	3,027	61	2,766	56
30 "	4,013	81	4,467	91
5 May	4,468	91	4,773	97
10 "	4,745	96	4,883	99
15 "	4,840	98	4,900	100
20 "	4,886	99	4,906	100
25 "	4,941	100	4,915	100
31 "	4,945	100	4,941	100

The figures in the table refer to the collective holdings only. According to 1938 data they possess altogether about 95 per cent of the total area in the Union sown to cotton, the remaining area being in State holdings. Examining these data it can be estimated that during the current year there will be in the Union 5 190,000 acres sown to cotton, that is an area equal to the figure for 1939 but exceeding by about 4 per cent the average area of the preceding five-year period which amounted to 4,999,000 acres.

In spite of adverse meteorological conditions the sowing campaign is considered to be progressing on the whole satisfactorily.

During May, almost all the principal zones under cotton have had rain which was often even considerable. On the other hand, the temperature, considerably below the normal, has caused a noticeable delay which amounted to 12-15 days in some zones. In many regions, especially where the cotton culture is not irrigated (Ukraine, Crimea northern Caucasus, etc.) an excessive growth of weed is noticed.

In several zones, crop works are suffering delay. In the irrigated region, the sources which supply the irrigation system have rather poor water reserves which will have to be used with the greatest care in order to ensure a normal development of cotton culture.

Argentina. During the third week of May weather conditions were better than in the preceding week. Picking and ginning were progressing. Insect activity was unimportant except for slight pink bollworm attacks in Saenz Peña and Corrientes.

According to the latest Government Cotton report, the second production forecast of the cotton year 1939-40 amounts to 365,300 bales of 478 lb. wet weight, compared with 370,800 bales estimated by the preceding forecast on March 1940. The final figure

for the cotton produced in the year 1938-39 being 327,000 bales, and the average production during the five years ending 1937-38 being 250,000 bales, production this year is estimated to be about 12 per cent. larger than that of last year and 46 per cent. larger than the average. On the other hand, the cultivated area, which amounts to 902,700 acres, is 10 per cent. less than that of last year, but 8.5 per cent. larger than the average of the five years ending 1937-38. The following third forecast of the production is bound to be issued on July 5.

Barbados: It was reported in April that the season had been favourable to cotton growing, and in St. Philip, where most of the crop was grown, harvesting was all but completed by the end of March.

No pink boll-worm had been seen and good yields were reported.

Brazil: The cotton year 1939-40 shows a further little expansion of cotton growing in Brazil, especially in São Paulo State. In effect, according to the latest available estimates concerning the northern and southern crops, total production may be estimated now at 2,075,000 bales of 478 lb. net weight, against 1,983,000 bales last year and an average of 1,614,000 bales during the five years ending 1937-38. The increase would be then one of 5 per cent. in comparison with the production of last year, and one of 30 per cent. in comparison with the average. Cotton acreage figures being not published officially, it is ignored if the increase of production is consequent to a corresponding widening of acreage or to larger yields per acre, which may differ greatly from year to year, according to the region where crops are grown and the seasonal weather conditions. However, it is likely that cotton acreage may reach about 6,000,000 acres, as against an average of about 4,050,000 acres during the five years ending 1937-38.

Up to the year 1932-33, when the world cotton crisis reached its bottom, cotton production in the Southern Brazilian States was by far smaller than that of the Northern States. But since the year 1933-34 this position began to be reversed, thanks principally to the efforts accomplished in the São Paulo State. At present, cotton production in the North is estimated at 600,000 bales of 478 lb. net weight, while that of the Southern States, of which the bulk is produced in the São Paulo State, amounts to more than 1,475,000 bales.

United States: During the week ended May 15 conditions in the cotton belt generally favoured the progress of planting, except locally in the central portions of the belt. During the following week planting and other conditions were mostly favourable. Rainfall was generally light. Temperatures averaged considerably below normal in the north-central districts but were normal elsewhere. Rains were needed in sections of the belt east of the Mississippi River. There were substantial rains, except in the south-east where needed, during the last week of May. Temperatures averaged near normal in the eastern portions of the cotton belt, while in the central and western portions, especially the north, they were unfavourably cool. These variable conditions continued practically during the following two weeks up to June 12, and cotton crop progress was reported as being fairly satisfactory. During the week ended June 19, the same conditions generally prevailed and the cotton crop was somewhat retarded by cool or rainy weather, except in the eastern portions of the belt.

(Telegram of June 27): During the week ending June 25 weather was variable, but conditions were generally favourable for cotton.

*Summary of the Cotton Reports issued by the Government of the United States,
during the cotton season (August 1-July 31).*

	Provisional estimates for dates indicated 1939-40	Final estimates		Percent. 1939-40	
		1938-39	Average 1933-34 to 1937-38	1938-39 = 100	Aver. = 100
<i>Report referring to July 1:</i>					
Area in cultivation (acres)	24,943,000	25,018,000	32,178,000	99.7	77.5
<i>Report referring to August 1:</i>					
Area left for harvest (acres) (1)	24,424,000	(2) 24,248,000	(2) 29,427,000	100.7	83.0
Crop condition (per cent of normal)	74	78	(3) 70	—	—
Production (4)	11,412,000	11,944,000	12,933,000	95.5	88.2
Yield of lint per acre, in lb.	223 7	235 8	(3) 190 8	94 9	117.2
Cotton ginned to August 1 (5)	137,076	157,865	100,900	86 8	124.7
Cotton ginned to August 16 (5)	309,677	314,616	370,885	98 4	83 5
<i>Report referring to September 1</i>					
Area left for harvest (acres) (6)	24,222,000	(2) 24,248,000	(2) 29,427,000	99 9	82 3
Crop condition (per cent of normal)	70	65	(3) 61	—	—
Production (4)	12,380,000	11,944,000	12,933,000	103 6	95 7
Yield of lint per acre, in lb.	214 7	235 8	(3) 190 8	103 8	128 2
Cotton ginned to September 1 (5)	1,402,970	1,335,643	1,436,526	105 0	97.7
Cotton ginned to September 16 (5)	3,876,616	3,634,922	3,303,775	106 6	117 3
<i>Report referring to October 1:</i>					
Crop condition (per cent. of normal)	68	66	(3) 61	—	—
Production (4)	11,928,000	11,944,000	12,933,000	99 9	92.2
Yield of lint per acre, in lb.	235 7	235 8	(3) 190 8	100 0	123 5
Cotton ginned to October 1 (5)	6,686,712	6,577,109	5,878,909	101 7	113.7
Cotton ginned to October 18 (5)	8,877,681	8,925,828	8,314,616	99 5	106.8
<i>Report referring to November 1:</i>					
Production (4)	11,845,000	11,944,000	12,933,000	99 2	91 6
Yield of lint per acre, in lb.	234 1	235 8	(3) 190 8	99 3	122.7
Cotton ginned to November 1 (5)	10,080,535	10,124,773	9,811,853	99 6	102.7
Cotton ginned to November 14 (5)	10,683,371	10,742,579	10,806,724	99 4	98 9
<i>Report referring to December 1:</i>					
Area in cultivation, on July 1 (acres)	24,832,000	25,018,000	32,178,000	99 3	77.2
Area left for harvest (acres) (7)	23,928,000	(2) 24,248,000	(2) 29,427,000	98 7	81 3
Production (4)	11,792,000	11,944,000	12,933,000	98 7	91 2
Yield of lint per acre, in lb.	235 6	235 8	(3) 190 8	100 0	123 6
Average gross weight of running bale, lb. (8)	514 0	513 8	(3) 511 2	100 0	100 5
Cotton ginned to December 1 (5)	11,111,422	11,230,522	11,630,355	98 9	95 5
Cotton ginned to December 13 (5)	11,775,550	11,412,139	11,957,256	98 8	94 3
Cotton ginned to January 16 (5)	11,404,924	11,552,913	12,356,445	98 7	92 3
<i>Report of March 20:</i>					
Total ginnings throughout the season (5)	11,477,133	11,623,221	12,589,968	98 7	91.2
Equivalent cotton ginned (4)	11,812,281	11,944,340	12,933,224	98 9	91 3
Average gross weight of running bale, lb. (8)	514 6	513 8	(3) 511 2	100 1	100.6
Total number of running bales, excl. linters	11,564,703	11,702,210	12,760,759	98 8	90 6
Including Sea Island	2,170	4,300	1,026	50 5	211 5
American-Egyptian	26,824	20,503	13,979	130 8	191 9
Upland. Round bales	175,140	157,979	341,582	110 9	51.3
Upland. Square bales	11,360,569	11,519,428	12,404,172	98 6	91.6
Linters running bales . . . . .	...	1,113,312	1,015,845	...	...
Linters equiv. 500-pound bales, net weight	...	1,329,208	1,214,933	...	...
Number of gineries: total . . . . .	...	13,998	14,598	...	...
Number of gineries operated	11,884	12,279	12,896	96.8	92.2
Average number of bales ginned per active establishment (5)	966	947	976	102.0	98.9
<i>Report of May 25:</i>					
Revised estimates of the cotton crop					
Area in cultivation, on July 1 (acres)	24,683,000	25,018,000	32,178,000	98.7	76.7
Area picked (acres) (7)	23,805,000	24,248,000	29,427,000	98.2	80.9
Production (4)	11,817,000	11,944,000	12,933,000	98 9	91.4
Yield of lint per acre, in lb.	237.9	235 8	(3) 190 8	100.9	124.7
Cottonseed produced (sh tons)	5,260,000	5,309,300	5,750,100	99.1	91.5

(1) Area in cultivation on July 1 less the ten-year (1929-38) average abandonment, about 2.2 per cent. — (2) Area actually harvested. — (3) Ten-year (1928-37) average. — (4) In bales of 478 lb. net weight and exclusive of linters. — (5) In running bales, counting round bales as half bales and exclusive of linters. (6) Per cent. of the acreage in cotton on July 1, 1939, which has been, or will be, abandoned: 2.9, compared with 3.1 in 1938. — (7) Per cent. of the acreage in cotton on July 1, 1939, which has been abandoned: 3.6. — (8) Counting round bales as half bales and exclusive of linters.

Burma: According to the Final Forecast of the cotton crop in Burma for the year 1939-40, the area sown is estimated at 363,000 acres, compared with 410,600 acres, final figure for last year, and 493,500 average of preceding five years, percentages: 88.4 and 73.6. The area harvested is estimated at 313,200 acres, as against 349,100 last year. The decrease of acreage is due to the fact that some of the cultivators replaced other crops for cotton, because cotton market was very poor. The total outturn is now estimated at about 79,700 bales of 478 lb. net weight, compared with 89,000 last year, and 94,400 average of preceding five years; percentages 89.5 and 84.4. More than 90 per cent. of the production is likely to be available for export.

India: Toward the end of May in the Punjab light showers have occurred in Gurgaon, Ambala, Lyallpur and Multan. The condition of the crops was average to good in irrigated areas and under average to average in unirrigated areas. In Bombay light to moderate rain has fallen though it was heavy in places.

Belgian Congo: According to the latest available information, cotton production of the current year 1939-40 may be estimated at 186,800 bales of 478 lb net weight, against 162,300 bales last year, and an average of 126,400 bales during the five years ending 1937-38. There would be then an increase of 15 per cent. in comparison with last year and one of 48 per cent in comparison with the average. Picking and ginnings in the northern cotton districts end by April, while in the South picking starts normally in June.

Egypt During the first half of May temperate weather conditions, with tendency to heat during most of the days, have had a favourable effect in accelerating growth. Branching started in early cultivations in the southern Delta and Middle Egypt where flowering buds (squares) began to form. In Upper Egypt the formation of buds is progressing and flowering has started. Hoeing, watering and manuring are going on. In late and general cultivations thinning is continued, as also resowing in certain late cultivations. Growth is satisfactory and pests are normal, though the starting of infestation is considered to be a little earlier than last year.

According to the third and final report issued as usual the first Monday of June, cotton production in 1939 is estimated now at 1,801,000 bales of 478 lb net weight, as against 1,728,000 bales in 1938, an increase of 4.2 per cent, and 1,850,000 bales for the five-year average ending with 1937, a decrease of 2.9 per cent. The area harvested is estimated at 1,687,000 acres, a decrease of about 9 per cent in comparison with the corresponding areas of 1938 and the five-year average. The average yield of a little more than 510 lb. of lint per acre obtained from the crop of 1939, is comparable to that of 1936 and second only to the record of 1937. The acreage figure is the lowest after that of 1932 and compares with that of 1927.

As may be seen from the final ginning returns for the season 1939-40, the total outturn, including scarto cotton, is a little larger than the production estimate, probably because it includes some quantities of cotton produced in 1938 and ginned after May 14 1939.

The first estimate of the cotton acreage of 1940 is due to be issued on July 15.

Cotton ginned up to the end of April, in bales of 478 lb. net weight was as follows:—

Varieties	1940	(1) 1939	(2) 1938	1937	1936	1935	1934
Giza 7	528,543	381,945	477,903	301,310	262,504	198,463	91,202
Sakellariadis	42,658	55,631	92,175	107,764	186,742	207,736	238,967
Other varieties above:							
1 1/4"	97,115	91,451	106,172	92,674	101,043	53,348	111,649
1 1/2"	86,724	44,575	30,710	30,378	43,151	43,940	75,551
1 3/4"	1,012,199	1,050,421	1,320,395	1,222,804	1,135,246	1,027,953	1,225,546
Total	1,767,239	1,624,023	2,027,355	1,844,930	1,728,686	1,531,140	1,742,915
Scarto	34,222	34,041	35,281	42,234	39,895	34,145	33,993
Total production (including Scarto)	1,801,461	1,728,090	2,281,223	1,887,164	1,768,581	1,565,583	1,776,908

* Final estimate. — (1) Ginning season ended on May 14. — (2) The ginning season was prolonged up to May 31.

*Classification of the Egyptian cotton crop by staple length,
in bales of 478 lb. net weight.*

(ooo's omitted)

Varieties	1939		1938		1937		1936		1935		1934	
	Acres	Bales*	Acres	Bales	Acres	Bales	Acres	Bales	Acres	Bales	Acres	Bales
1) Long staple: above 1 3/8"	812	668	871	562	836	740	709	592	702	551	800	460
(<i>Sakellaridis</i>)	(72)	(43)	(143)	(61)	(167)	(116)	(168)	(108)	(309)	(187)	(436)	(208)
(<i>Giza 7</i>)	(625)	(529)	(595)	(405)	(539)	...	(423)	...	(280)	...	(297)	...
2) Long-medium staple: above 1 1/4"	68	87	54	46	31	32	36	30	57	43	79	44
3) Medium staple: above 1 1/8"	807	1,012	927	1,084	1,186	1,469	1,036	1,223	974	1,135	919	1,028
<i>Scario</i>	—	34	—	36	—	40	—	42	—	40	—	34
<i>Total</i>	1,687	1,801	1,852	1,728	2,053	2,281	1,781	1,887	1,733	1,769	1,798	1,566

*) Final estimate. — (1) Maarad, Sakha 4, Sakellaridis, Malaki, Giza 7. — (2) Wafeer, Fuâdi, Giza 3, etc. — (3) Ashmûni and Zagôra.

Anglo-Egyptian Sudan: Toward the end of May the area cultivated with cotton for the year 1939-40 was officially estimated at 426,500 acres, as against 458,100 acres last year and an average of 401,600 acres during the five years ending 1937-38, percentages 93.1 and 106.2. Production was estimated at 235,200 bales of 478 lb. net weight, against 263,300 bales last year and a five-year average of 225,400 bales, percentages: 89.3 and 104.3.

About 70 per cent. of the cotton area are irrigated, yielding Egyptian cotton of the Sakellaridis variety (85 per cent. of the total production) and American Upland varieties (2.5 per cent. of the total). The 30 per cent. remaining area is not irrigated and is cultivated exclusively with American Upland rain-grown varieties with a yield amounting to 12.5 per cent. of the total production.

In comparison with last year, there is a reduction of more than 17,200 acres in the irrigated crops and one of 14,300 acres in the rain-grown crops. However, the production of American rain-grown cotton is larger than that of last year by more than 5,500 bales, while the amount of Sakellaridis produced is smaller by about 31,400 bales and that of American irrigated is also smaller by 2,300 bales.

Tanganyika: Conditions of the cotton crop during April were as follows.

Central and Southern Highlands Provinces: In the Singida area the cotton crop was very disappointing and growth, in spite of early planting, was unsatisfactory.

Lake and Western Provinces: It was reported that the wet season had resulted in considerable damage to cotton by Lygus insects; Jassid and American boll-worm were also causing severe damage in some parts and in Shinyanga stainers were present in large numbers. Losses from these causes were stated to be appreciable but nevertheless a record crop was expected.

Eastern and Southern Provinces: The distribution of cotton seed has been considerably increased over that of last year in all areas. Planting was complete or nearly so practically everywhere and growth was good. In Western Rufiji planting had been delayed because of the food shortage and in the

rest of the valley by the extensive flooding of the river. In the Kilosa and Ulanga districts cotton planting was well ahead and growth very satisfactory.

Northern and Tanga Provinces. Record amounts of cotton seed had been taken by natives and planting in some districts was almost completed. It was stated that there would also be an increase in the amount of non-native cotton.

CURRENT INFORMATION ON HEMP.

Hungary: Hemp was growing well about June 4, but the crop requires more heat.

Yugoslavia: Prospects of good profits due to the large demand for hemp and its high price on the world market have encouraged farmers to increase the area sown to hemp this year.

U. S. S. R. On May 31 the area sown to hemp in kolkhozi was 917,300 acres, or 69 per cent. of the Plan, against 1,099,100 or 84 per cent sown at the same date last year.

CURRENT INFORMATION ON TOBACCO.

Hungary Transplantation was still in progress here and there on June 4. The tobacco crop requires more heat.

Yugoslavia Towards the end of May tobacco planting was almost over in Herzegovina. Weather conditions during May were rather favourable to planting and to the growth of the crop.

U. S. S. R. Tobacco sowing was much retarded. In kolkhozi in which about nine-tenths of the tobacco area is cultivated in the Union 137,900 acres of yellow-leaf tobacco, or 63 per cent. of the Plan, had been sown on May 31, against 172,700, or 83 per cent., at the same date last year. For the "Makhorka" variety the corresponding figures are as follows: 103,000 acres, or 47 per cent., and 106,800 or 50 per cent.

Algeria: Tobacco planting continued, the second dressing of the plantings-out effected at the beginning of the season is being applied. Some damage caused by grey worms has been reported.

CURRENT INFORMATION ON HOPS.

Hungary: At the beginning of June hops were growing well.

CURRENT INFORMATION ON OTHER PRODUCTS:

Cacao.

St. Lucia: It was gazetted on April 13 that all general licences for the export of cacao were cancelled and any person wishing to export cacao to the United Kingdom should apply for a licence stating the quantity and the steamer by which it was to be shipped. It was also announced that the export quota allotted to St. Lucia for the year ending September 30, 1940, had been increased to 180 tons (403,200 lb.).

Gold Coast and Togoland under British Mandate: MAIN CROP 1939-40. — During April activity consisted in the marketing of the last parcels of main crop, purchasing

of which ceased with the moratorium beginning on April 1, 1940. It had been generally considered that whatever cacao was being held by farmers would come into the market rapidly on the announcement of the moratorium but very little materialized, the total tonnage marketed during the month being 5,542,000 lb.

From Cacao control records it is evident that the total crop marketed is approximately 504 million lb. The distribution over the season, using percentage estimates from districts for harvesting and control data for purchases, is as follows:

	Harvested		Marketed	Farmers stocks
	%	million lb	million lb	million lb
September	4	20	6	15
October	16	81	56	39
November	29	146	52	133
December	30	152	145	111
January	17	85	187	36
February	4	20	52	6
March	—	—	6	—
	100	504	504	

It was reported that it was not yet possible to allocate the crop between the provinces, as some Provincial Crop Estimates Committees had not yet prepared their final estimates.

By taking monthly marketed and export tonnages, the stocks left in merchants' hands can be computed. Two direct returns of stocks are also available, a monthly record from firms sent in for the use of the Crop Estimates Committee and weekly returns under Cacao Control. Differences in the returns due to odd days between the end of a control weekly accounting period and a month end, to odd parcels of sub-grade taken out of stock and to discrepancies in the returns, have been adjusted to provide the approximate totals given in the table.

The carry over on September 30, 1939, based on data supplied for Cacao Control showed that 5.6 million lb. of new crop and 39.9 million lb. of old crops were in stock.

This is an increase of 6.3 million lb. on the carry over based on firms returns sent in at the end of September and confirmed by the Crop Estimates Committee. The carry over figure of 33.6 million lb. previously given is now amended to 39.9 million lb.

	Export	Firm stocks
	(million lb.)	
September	—	46
October	21	81
November	40	92
December	54	184
January	72	300
February	29	323
March	40	288

As regards quality, check sampling at the ports showed the following grade tonnage this season:

	Grade I	Grade II (million lb)	Grade III
October-November	16	31	7
December to March.	80	108	9
<i>Total . . .</i>	<i>96</i>	<i>139</i>	<i>16</i>

On November 16, 1939, stocks returned to Cacao Control showed 94 million lb. of grades I and II together and 13 ½ million lb. of grade III. Since marketing was resumed on December 8, 1939, returns by firms show negligible amounts of grade III cacao, practically all purchases being shown as grades I and II. (Sub-grade is not purchased).

The average number of beans per standard 14 cubic inches was 121.9 during the six month period October 1939-March 1940, as compared with a mean of 126.2 for the 1938-39 main crop and a mean of 125.7 for the 5 year period 1933-34 to 1937-38 main crops. The main crop means are calculated on the October-May shipments which represent about 80 per cent of the annual exports. This season the exported per cent. is less than normal, but the difference in the above figures is sufficient to indicate that the beans this season are larger than the average.

At a meeting held in Accra on April 8, 1940, the Crop Estimates Committee made the following finding in regard to main crop 1939-40 "According to the data supplied to Cacao Control approximately 225,000 tons (504 million lb.) had been marketed and as marketing ceased on 31 March this represented the main crop. The Committee had no knowledge of the crop remaining in farmers' hands, but believed it to be negligible."

MID CROP 1940. — It was reported that no estimates had yet been prepared by Provincial Cacao Crop Estimates Committees.

MOVEMENT. — Movements statistics for March are as follows

	March 1940	March 1939* (million lb)
Railway off-loadings, Takoradi	11.5	21.4
<i>Exports:—</i>		
Takoradi	19.4	26.9
Accra	18.9	43.0
Other ports	4.9	15.7
<i>All ports . . .</i>	<i>43.2</i>	<i>86.5</i>
Eastern Frontier	0.1	1.1
<i>Total exports . . .</i>	<i>43.3</i>	<i>87.6</i>

Tea.

India: In North India seasonable weather with heavy rainfall and in some places hail storms which caused considerable damage were experienced during the month of March and the first half of April. Crop prospects appeared to be good. In South India, the weather continued to be dry and very hot and only one light shower of

rain was reported. Crop prospects were considered to be poor for the time being. In North India plucking was only starting here and there and very little leaf was taken off during the month. In South India the outturn was 8.97 per cent. behind that to the same date last year.

Japan: Crop condition, which was considered as rather bad during last month has now improved slightly.

Tanganyika: It was reported in April that the condition of the tea crop was satisfactory and good yields were expected.

Coffee.

Brazil: Altogether 152,000 centals of coffee were destroyed in Brazil during April. The total quantity of coffee removed from the market from 1931 to the end of April, 1940, amounts to 90,500,000 centals

The Congress of Brazilian Coffee-Producing States, assembled under the auspices of the "Departamento Nacional do Café", drew up a programme for the 1940-41 season. The plan contemplated the adoption of a series of measures aiming at the establishment of a statistical balance between the amount of coffee exported and the possibility of its absorption on the world coffee market. A measure of outstanding importance is that contained in the decision to form an *adjustment quota* for the 1940-41 trading season amounting to 25 per cent. of the total output; this percentage will be purchased by the National Coffee Department. An optional supplementary quota has been fixed for the State of S. Paulo. The plan adopted may be altered to meet conditions prevailing on the world coffee market and the requirements of coffee planters.

Salvador: The condition of the coffee plants was normal on May 1st. The rains which fell in the principal coffee-producing areas did much good. Flowering on the plantations was generally good.

Nyasaland: The forecast of an average coffee crop in 1939-40 has been confirmed.

Tanganyika: It was reported in April that prospects for the coffee crop were generally good, in some parts record yields were expected.

New Hebrides: The latest official report states that conditions on the coffee plantations varied in April between rather poor and poor.

Groundnuts.

Netherlands Indies: Java and Madura. — The Department of Agricultural Statistics of the Central Statistical Office communicates the following details of the groundnut area —

	1940 acres	1939 acres
Area harvested in March	48,400	50,700
Area harvested from January 1 to March 31 . .	124,800	134,700
Area of standing crops at the end of March . .	176,400	146,800

Tanganyika: It was reported in April that prospects for the groundnut crop were good on the whole.

Colza and Sesame.

Hungary: Colza was badly damaged by the severe winter. The crop from the remaining seedlings, except in a few departments, is expected to be only average or below the average.

Romania: As a result of the loss of a fair quantity of winter colza caused by frost, the area under spring colza has been increased. Towards mid-June colza was ripe and harvesting had started.

India: Toward the end of May the sesame crop in Orissa was thriving and condition was fair. The amount of rain was moderate.

Soya

Netherlands Indies: Java and Madura. — The Department of Agricultural Statistics of the Central Statistical Office communicates the following details of the soya area —

	1940 acres	1939 acres
Area harvested in March	25,500	22,000
Area harvested from January 1 to March 31 . .	58,300	54,900
Area of standing crops at the end of March . .	153,700	120,300

Jute.

India: Toward the 10 May the sowing of jute in Orissa was begun and it was progressing by the end of the month. The amount of rain was moderate.

FODDER CROPS CONDITIONS.

Other years under normal conditions in the month of June the Institute already possessed information on the situation of fodder crops in a large number of countries many of which gave the state of the crops for the main fodder plants. This allowed us to summarize the situation in a table. Under the present conditions, with information lacking for a considerable number of countries, we must limit ourselves to a short summary of weather conditions, on the basis of which more or less complete picture of the situation of these crops may be formed.

In Europe the rigours of the winter were severe, as has been confirmed by information reaching us from several countries, and in those regions where the snow-covering on the fields was not sufficient, fodder crops, particularly clover, have suffered. The spring in the majority of European countries has been somewhat rainy and wet; and if by reason of the amount of moisture in the soil the growth of fodder crops in general has found favourable conditions, the low temperatures have caused a considerable delay in the development of permanent meadows, temporary meadows and pasture land. There are, however, regions in which lack of sufficient moisture has been unfavourable to fodder plants.

On the whole weather conditions in the greater part of Europe have been favourable.

In the Soviet Union, as also in the United States and Canada, the weather conditions were also on the whole favourable to the development of fodder crops.

In Argentina during the month of May the state of the crops of meadows and of fodder cereals was good, although in some regions the need of rain was felt.

CURRENT INFORMATION ON FODDER CROPS.

Hungary: Mangolds were growing well about June 4, the foliage being thick and healthy. Old clover sowings were doing well but were on the whole rather thin. The first clover cut was in progress, offering a good or average yield here and there, but the crop is on the whole bad. New clover sowings are growing well.

During the period under review the alfalfa had begun to flower; the yield of the first cut is on the whole slightly above the average.

As regards other artificial meadows, vetch and oats are growing well and the first cut is already in progress. Maize sowings for green fodder are still in course, this crop requires more heat.

Sainfoin and moha are growing well. The rains and the warmer weather have encouraged growth of the natural meadows. Except in a few departments grass is growing well on the pastures affording sufficient bite for the stock.

Romania Towards June 12, clover and alfalfa were well forward, unfortunately owing to frequent rainfalls the cutting of the crop could not be done in due time.

Conditions of natural meadows and of pastures were also very good. For mangolds an increase of acreage against the previous year was officially forecast.

Sweden: On June 1st crop condition of the artificial meadows, expressed according to the system adopted by the Institute, was 98, the same as on June 1, 1939, expressed according to the system used in Sweden, the crop was classified at 2.9.

Switzerland: The persistent drought which prevailed during the first fortnight in May affected the growth of grass, and consequently permanent and temporary meadows are expected to give only average yields. Many areas, especially among the old grazings, showed no grass at all. Many of the alfalfa fields are in bad condition, the winter's frost and damp having killed numbers of plants, especially among the old alfalfa fields. The rains which fell in the higher areas during the second half of the month were beneficial to growing grass and prospects for fodder supplies have therefore improved. The quality of the hay crop is expected to be excellent.

Conditions are good on the Alpine meadows, the grass is growing satisfactorily and some of the stock has already been sent to summer quarters on the Prealps.

On the basis of the system adopted in the country, crop condition on the permanent meadows was quoted at 74 on June 1, as against 79 on May 1, 1940 and 82 on June 1, 1939; temporary meadows (clover, alfalfa, etc.), were respectively quoted as follows 74, 75 and 60. Quotations for pastures were 76 on June 1, as against 73 on the same date in 1939.

U. R. S. S.: The new policy adopted recently by the Government with regard to the supplying of agricultural products to the State, and based, not on the area of a determined crop, but on the total area under cultivation on each collective holding, has been extended also to animal production and must determine an ulterior increase of the area destined to the production of fodder plants. In fact, according to the Plan, on the collective holdings, which normally constitute about 4/5 of the total area planted to fodder crops in the Union, this area has been forecast as 36,122,000

acres against 25,220,000 acres on 1939 (provisional data) and 19,156,000 acres cultivated in 1937. In this area permanent meadows and pastures are not included.

The data on the execution of the Plan during the current year have not yet been published.

As to the situation of the fodder crops, based on the trend of the season, it may be considered that at the beginning of June, in the greater part of the territory, this was satisfactory.

Argentina. Crop condition of fodder cereals and pastures was on the whole good throughout the country. Rain was lacking in several areas.

Egypt. Crop condition of the clover crop on June 1 was estimated at 99, the same as the preceding two months, compared with 101 on June 1 1939. The start of the crop in autumn was rather bad, with a crop condition on November 1 of 83, compared with an average of 100 on the same date, however during the spring conditions bettered and the yield seems to have been quite normal.

LIVESTOCK AND DERIVATIVES

ANIMALS SLAUGHTERED AND MEAT OBTAINED IN BULGARIA (1).

SPECIFICATION	ANIMALS SLAUGHTERED			MEAT OBTAINED		
	1939	1938	1937	1939	1938	1937
	number			Weight in thousand lb		
<i>Cattle</i>	140,410	152,816	139,691	34,561	33,638	32,863
Calves under 1 year	35,311	53,179	43,935	4,336	6,843	5,930
Young bulls and heifers 1 year and under 3 year	25,511	32,902	31,055	4,192	5,328	5,023
Oxen and bulls	43,811	39,855	41,445	16,500	14,614	15,716
Cows	35,777	26,880	23,256	9,533	6,853	6,194
<i>Buffaloes</i>	33,225	37,457	39,071	8,864	8,741	9,553
Young stock under 1 year	7,040	12,350	11,515	806	1,445	1,312
Young stock from 1 to 3 year	6,720	8,803	10,200	1,157	1,451	1,742
Buffaloes and bulls	5,595	5,520	6,603	2,277	2,250	2,776
Buffalo cows	13,870	10,784	10,703	4,624	3,595	3,723
<i>Pigs</i>	87,277	120,975	105,695	16,738	20,010	17,281
Suckling pigs and young pigs by weight to 20 kg	3,308	10,898	8,317	74	155	107
Young pigs of 20 to 90 kg	46,748	74,003	55,454	6,777	10,467	8,146
Other pigs of 90 kg and over	37,221	36,074	41,924	9,887	9,388	11,028
<i>Sheep</i>	1,624,228	1,639,623	1,620,234	32,038	30,832	31,595
Lambs under 6 months	1,153,532	1,200,743	1,170,908	17,908	18,086	18,191
Lambs from 6 months to 1 year	84,815	98,367	87,006	1,725	1,976	1,776
Wethers and rams	67,456	50,072	48,423	2,605	1,948	1,871
Ewes	318,425	290,441	313,897	9,800	8,822	9,757
<i>Goats</i>	127,083	156,696	177,409	2,666	3,330	3,416
Kids under 6 months	85,876	104,752	132,184	1,249	1,507	1,919
Kids from 6 months to 1 year	7,584	5,031	7,725	126	85	118
He goats, including castrated	3,541	3,182	4,093	177	154	187
She goats	30,082	43,731	33,407	1,114	1,584	1,192
General total	—	—	—	94,867	96,551	96,708

(1) Figures relating to all towns of the Kingdom

LIVESTOCK PRODUCTS IN GREECE

CLASSIFICATION		1939	1938	1937
<i>Animals slaughtered in towns and meat obtained</i>				
<i>Slaughterings.</i>				
Cattle	number	167,417	170,870	162,977
Sheep	"	1,866,162	1,811,939	2,054,365
Pigs	"	55,406	55,147	57,184
<i>Meat.</i>				
Beef	weight in thousand lb	44,676	44,600	42,050
Mutton	"	53,661	51,722	58,104
Pork	"	9,131	8,962	9,183

GENERAL REVIEW OF THE PRODUCTION AND INTERNATIONAL TRADE OF PRESERVED MILK

The volume of the production of milk undergoes periodic fluctuations, due above all to the influence of the seasons on the fodder crop situation and to the calving periods. If a graph is made of the production of milk over a period of several years, an undulating line of development is obtained. Consumption is also liable to marked fluctuations. Here, it is true, the fluctuations show, following the many possibilities of utilizing milk, differing tendencies which may be reciprocally compensated or re-inforced. In general the consumption of fresh milk is particularly high during the warm season, that is during the period of abundant milk production, without however exactly coinciding with it. The demand for butter and cheese reaches its high for example just before the big festivals, at a period therefore when the production of milk is generally lower. In the demand for the various kinds of cheese there have been noted also variations due to the season and to weather conditions. The quantity of milk which, consequent on these fluctuations in production and demand, constitutes an excess over the actual needs, may be preserved by a number of different processes, so that it may be consumed as milk later on. The most common process is that of condensation and of dessiccation, with or without the addition of sugar. Then there is the process of milk sterilization, by which the water content is not modified to any great extent.

The processes of milk preservation allow not only of a delay in the time of consumption, but also make it possible for the milk to be consumed in places far from the region of production. Fresh milk, also, it is true, enters in international trade, but this trade has, as a rule, only a local importance (1). On the other hand, preserved milk lends itself to international trade; it is parti-

(1) For the total production of milk and the portion consumed as fresh milk in the various countries, cf. the table on the production of milk, and also the notes on its utilization in this year's "International Yearbook of Agricultural Statistics", appearing there for the first time.

cularly important for furnishing milk to tropical regions and other regions which have an insufficient stock of milch animals, since the white inhabitants living in these regions often find it difficult to procure fresh milk.

The transformation of fresh milk into preserved milk calls for extra expenditure. Apart from the necessary expenditure for the installation of machines and plant, the packing of condensed milk into hermetically-sealed tin containers constitutes an important item of expense. As a result, the prepared product is relatively dear, so that condensed milk from a certain point of view is a luxury, the sale of which is affected by the fluctuations of the economic situation. Dried milk is mainly used in the chocolate industry, which in some countries absorbs about 80 per cent. of the total production. Here again the consumption depends on the economic situation, as also for ice-cream, for the consumption of which the weather too exercises a decisive influence. Lastly, in the feeding of infants, which represents the third main factor in the utilization of dried milk, there exist lasting relations with the economic situation. It is thus perfectly comprehensible that the disturbances and changes in economic life may have a marked influence on the production of preserved milk.

Production of condensed milk.

(ooo lb.)

COUNTRIES	1938	1937	1936	1935	1934	1933	1932
United States	2,809,152	2,595,541	2,707,665	2,401,768	2,236,648	2,192,064	2,090,430
United Kingdom ⁽¹⁾	—	—	—	335,115	—	—	—
Netherlands	345,044	379,714	292,629	259,461	267,371	—	—
Germany	187,182	183,372	144,242	117,527	—	—	—
Canada	122,207	110,543	84,684	80,287	70,533	68,650	68,179
Japan	44,684	52,514	39,904	44,837	39,308	32,065	24,734
Australia	42,931	41,604	32,067	—	—	—	—
Denmark	37,729	36,594	34,081	39,535	45,023	60,960	51,842
France	—	28,953	—	—	—	—	—
Switzerland ⁽¹⁾	19,842	17,637	16,535	13,669	14,110	26,456	35,274
Italy	—	10,426	—	—	—	—	—
Sweden	4,502	4,079	3,583	3,422	3,117	2,690	2,643

⁽¹⁾ Production of firms employing more than ten persons. See also data on the text. — ⁽¹⁾ Including dried milk.

The data concerning the production of preserved milk have been grouped in separate tables for condensed and dried milk. The few data available for sterilized milk have also been put into a separate table. Given the difference between the individual groups no attempt has been made to calculate the total of preserved milk as a whole. The data for the first two groups mentioned above represent the sums of the various figures relating to products obtained from whole milk, skim milk or buttermilk, with or without the addition of sugar. The year 1939 has been omitted from the table, owing to insufficient data. The few data available have been incorporated only in the text.

An interesting phenomenon is the fact that the relation between the production of condensed and dried milk in the various countries is generally analogous. This striking fact is confirmed by the fact that the lists of countries classified according to the importance of their production in the two tables, show only very slight differences. This fact is surprising, since there is no evident correlation between the two branches of the manufacture of preserved milk, either for production or for consumption. The manufacture is carried on only in part in factories which are interested in the two products. The differences in consumption have already been emphasized.

For condensed milk the United States is the greatest producing country, as for all the other products of the milk industry. The preponderance of the United States over all the other countries is even greater here than for all the other products, and production is so enormous that the production of all the other countries mentioned added together, calculated roughly, amount to barely half the production of the United States. The quantities have shown during the years under consideration, continuing a development noted a long time ago, a very marked increase. Only the year 1937 showed an interruption in this increase, probably in relation to governmental measures taken for the intensification of the production of butter. Against 2,147,310,000 lb produced in 1938 and representing about three quarters of the total production, 2,213,450,000 lb were reached in 1939 according to provisional data. There is therefore a new increase in production.

The most recent official data on the production of condensed milk in the United Kingdom includes only those factories employing more than ten persons in 1935. According to the publications of the Imperial Economic Committee the production coming under the Milk Marketing Schemes appeared greater by 353,900,000 lb in 1935, by 402,080,000 lb. in 1936, by 414,400,000 lb in 1937 and by 436,800,000 lb in 1938. These figures contain an approximate estimate of condensed skim milk. The figures show a remarkable increase in production.

The statistics of the Netherlands begin only in 1934. After a light falling off in 1935, there has been an increase in production until 1937. To the decrease during 1938, which must be considered in relation to the reduction of exports, a new decrease to 315,308,000 lb followed in 1939.

For Germany the figures of the «Hauptvereinigung der deutschen Milch und Fettwirtschaft» have been used, since the Statistical Office of the Reich does not distinguish between condensed and dried milk. The figures are published beginning from 1935 and up till 1938 show an increase of more than half. According to the same source, during the first nine months of 1939, 170,279,000 lb. have been produced. There is then a new very marked rise, taking into account that the difference in proportion to the whole year 1938 represents only about a tenth of the production.

In the majority of the other countries an increase in the production of condensed milk may be seen. Besides Canada, attention must be drawn to Japan, although the 1938 figures are slightly below those for the preceding year. On the other hand for Denmark there is an exceptionally strong decline between 1933 and 1936. During the two following years some increases are noted. The fall-

ing off is still more accentuated for Switzerland between 1932 and 1935, the figures include however dried milk. After this, here also a continual increase in production can be seen these fluctuations in the volume of production were due in part to the movements of external trade.

In the production of dried milk, the United States take a preponderant position compared to the other countries, analogous to that existing for condensed

Production of dried milk.

(000 lb)

COUNTRIES	1938	1937	1936	1935	1934	1933	1932
United States (1)	534 696	439,019	418,510	366 760	364 439	352,194	330 886
Netherlands	62,354	61,207	67,215	55 442	38,528	—	—
United Kingdom (2)	—	—	—	44,306	—	—	—
Germany	44 326	41,403	39 161	30,234	—	—	—
Canada	37,054	26 062	23,476	23,292	20,334	15,672	13,232
Australia	19,869	16,258	10 617	—	—	—	—
France	—	7,685	—	—	—	—	—
Italy	—	5 525	—	—	—	—	—
Japan	3 653	3 467	2,657	2 270	3 171	2,044	1,556
Denmark	2,370	3,057	2,707	1,746	1,431	1 254	1,504
Sweden	2,040	1,306	1,227	1 216	964	449	381

(1) Dry or powdered cream not included — (2) Production of firms employing more than ten persons. See also data on the text

milk. The increase of production in the United States is however greater for dried milk. For dried milk production no falling off is registered for 1937 and production shows an ascending line without interruption, the increase between 1937 and 1938 is especially remarkable since it is far greater than any other increase in the period under consideration.

In the Netherlands, production reached its first high in 1936 for dried milk, a year before that for condensed milk. Production showing a slight falling off from the two following years, may be considered the same. In 1939 there was a new marked impulse, bringing production to 84,918,000 lb. This figure was considerably larger than that for 1936 production.

For the United Kingdom, the data furnished by the Imperial Economic Committee refer only to dried whole milk. The quantities are as follows 17,024,000 lb in 1935, 17,920,000 lb in 1936, 12,387,000 lb in 1937 and 18,950 000 lb in 1938. The official statistics for 1935 distinguish 20,316,000 lb of unsweetened dried whole milk, 17,955,000 lb. of unsweetened dried skim milk, 807,000 lb of sweetened dried milk, and 5,229,000 lb of dried milk not otherwise specified. As against the result for condensed milk, the figure of the official statistics for factories employing more than ten persons is higher.

For Germany the source mentioned above gives for the first nine months of 1939 a production of 45,056,000 lb, a figure which already surpasses that of the total production for the preceding year.

For the other countries, including Denmark, statistics show only increases. For New Zealand data concerning condensed milk and also dried milk are lacking for recent years. In 1927 the production of condensed milk was estimated at 6,508,000 lb, that of dried milk at 14,357,000 lb.

Then the exporting of condensed milk rose during the period 1927 to 1939 from 1,554,000 lb to 6,365,000 lb and that of dried milk from 10,864,000 lb to

Production of sterilized milk.

(000 lb)

COUNTRIES	1938	1937	1936	1935	1934	1933	1932
Germany	15,230	18,473	19,824	18,391	—	—	—
Denmark <i>milk</i>	341	580	676	796	701	536	791
Denmark <i>cream</i>	22,772	20,865	18,683	19,434	20,051	19,917	20,876
Italy . . . . .	...	3,527	—	—	—	—	—

18,182,000 lb. As a result, production must have increased at least in corresponding proportion.

To complete this study, the scarce data referring to the production of sterilized milk are given. In the figures of the «Hauptvereinigung der deutschen Milch und Fettwirtschaft», a reduction in 1938 is noted for Germany. During the first nine months of 1939, 10,415,000 lb of sterilized milk had been produced. For Denmark the changes are very slight. The preponderance of cream is remarkable.

International Trade.

In the tables given, for 1939 only the data for those countries which have published complete statistics for the whole year have been included. As a result the order of importance of the countries according to the volume of their foreign trade has not been changed. It is surprising that for the most important exporting country of condensed milk, the Netherlands, the export figures, with the exception of 1937 and 1938, are greater than those for production. This can be explained to some extent up to 1936, because export figures represent gross weight. For 1939 it may be admitted that the difference may be accounted for by the stocks of preceding seasons. Since the interruption of the comparability of the statistics by the change from gross to net weights, a continual decrease in exports may be noted.

The relation between the Netherlands and the United States as regards exportation may be said to be the opposite of that for production. If the Netherlands, which rank third among the producing countries, occupy in world trade (owing to the exportation of almost all their production) a preponderant place

analogous to that of the United States with regard to production, the latter, which export only 2 to 3 % of their production, take second place among exporting countries, ranking far below the Netherlands in quantities. Denmark, whose exports have remained almost without change during recent years, exports, like the Netherlands, almost all her production to the world market.

Exports of Condensed Milk.

(ooo lb.)

COUNTRIES	1939	1938	1937	1936	1935	1934	1933	1932
Netherlands	¹⁾ 317,010	¹⁾ 335,375	¹⁾ 367,878	¹⁾ 381,749	¹⁾ 342,487	¹⁾ 352,968	¹⁾ 371,055	¹⁾ 396,937
United States	29,747	29,121	30,843	25,926	39,113	46,161	37,080	44,800
Denmark	31,178	28,903	27,490	24,333	24,579	19,112	18,376	16,813
	38,142	38,634	37,525	36,963	40,664	48,407	53,718	56,591
United Kingdom . . . . .	...	31,634	36,623	47,942	36,954	26,857	19,965	9,919
Canada	26,149	29,696	28,973	15,223	19,753	21,145	23,069	21,012
Switzerland	13,686	14,407	12,778	11,837	12,816	13,093	20,324	29,491
Australia	17,218	14,246	22,899	13,885	11,801	14,127	19,791	17,469
France (a) . . . . .	...	13,252	10,966	10,670	9,696	11,801	11,195	14,370
Ireland . . . . .	...	12,414	13,704	13,484	12,416	12,139	14,148	10,234
Japan	14,165	11,385	7,070	10,838	11,907	7,681	2,998	2,388
British Malaya	9,231	8,927	11,936	8,651	8,188	7,112	5,743	6,995
Norway	4,533	6,281	5,086	3,997	4,709	3,258	4,109	8,331
New Zealand	6,365	5,417	8,587	6,499	6,206	4,070	1,960	1,812
Italy (a) . . . . .	...	1,526	4,037	3,252	3,512	4,180	4,720	4,883
Belgo-Luxemburg	2,152	1,257	1,876	902	2,441	4,539	7,529	6,468
Chile . . . . .	...	586	1,497	1,486	1,345	1,358	880	324
TOTAL . . . . .	...	583,061	629,768	617,637	586,587	598,008	616,930	648,837

a) To foreign countries. — b) To Alaska, Virgin Islands, Puerto Rico and Hawaii

¹⁾ Net weight. — ²⁾ Gross weight. — ³⁾ Including dried milk.

The United Kingdom is both an importer and an exporter. The quantities exported are, however, of little importance, but up to 1936 they increased considerably while at the same time importation declined. During the succeeding period a new decline is noted. From January 1 to August 31 exports totalled 23,243,000 lb in 1939 as against 21,455,000 lb in 1938; thus exportation was again slightly increased. Canada's exports could no longer be maintained in 1939 at the level of the two preceding years. In general the trend of Canada's exports was irregular.

Switzerland may be said to maintain the volume of its exports which had considerably declined in comparison to the preceding period.

Taken as a whole, there has been a decline in exportation of about 20,000,000 lb as compared to the preceding year.

Among the countries importing condensed milk, the United Kingdom is the only important European country, with by far the most important quantities imported. Up to August 31, her imports were 106,356,000 lb in 1939, as against 131,226,000 lb in 1938; her imports have, therefore, suffered a heavy decrease.

Among the other countries there are hardly any which are not tropical regions or colonies. Only at a great distance follow a few European countries such as France—which, like the United Kingdom has at the same time a considerably greater export,—Greece and Germany. From the table, hardly perceptible

Imports of Condensed Milk.

(ooo lb.)

COUNTRIES	1939	1938	1937	1936	1935	1934	1933	1932
United Kingdom . . . . .	...	183,026	189,830	188,699	200,075	234,390	273,795	307,713
British Malaya	85,066	88,185	92,323	66,196	63,615	58,092	45,579	43,259
Philippines	47,682	49,009	42,477	41,692	35,669	34,370	29,295	28,506
Netherlands Indies	39,216	37,792	39,769	29,216	28,078	27,097	24,844	24,456
Burma	22,110	19,945	17,178	22,225	23,594	19,599	19,500	19,216
India	8,001	6,440	11,420	22,289	19,694	16,614	13,508	11,771
Thailand (Siam) . . . . .	...	24,262	25,796	11,543	12,968	9,786	10,223	8,221
Hawaii (1)	14,828	13,993	13,658	7,097	6,063	5,712	3,322	4,956
Peru	11,036	11,532	9,493	8,250	8,003	6,786	6,424	6,962
Indochina	10,759	11,091	10,728	7,994	6,790	6,934	5,803	5,240
Jamaica	10,159	9,899	8,984	7,509	6,045	5,598	4,683	4,140
Trinidad and Tobago . . . . .	...	8,957	8,477	6,850	5,840	4,050	3,653	3,968
Puerto Rico (1)	9,024	8,144	7,555	4,793	5,097	6,164	5,781	6,973
Algeria (2) . . . . .	...	7,169	6,023	5,615	5,481	5,276	4,500	4,623
Alaska (1)	6,702	6,195	5,851	2,068	2,983	4,090	5,377	4,134
France . . . . .	...	3,135	2,498	4,780	4,268	3,100	2,802	3,179
Panama . . . . .	...	4,240	5,247	3,023	3,023	2,081	2,718	2,747
Canal Zone	3,644	3,038	2,033	3,168	3,098	3,272	3,499	3,362
Tunisia . . . . .	...	4,557	3,726	4,015	4,063	2,802	2,813	2,244
Malta . . . . .	...	4,519	4,905	3,311	3,133	3,144	3,336	2,818
French Morocco (3) . . . . .	...	4,352	4,030	3,318	3,203	3,150	2,388	2,533
Newfoundland	4,429	4,279	3,807	4,310	4,709	3,807	2,987	3,768
Greece	3,655	4,222	4,495	1,982	708	2,544	2,617	1,530
Union of South Africa	1,155	3,609	6,680	1,407	948	1,003	743	928
Venezuela . . . . .	...	...	3,869	2,282	1,839	1,054	454	309
Palestine	3,404	2,491	2,216	2,500	2,275	4,835	5,809	1,316
Germany (2) . . . . .	...	2,637	3,821	2,811	2,562	2,167	1,616	1,631
Curaçao (3) . . . . .	...	4,500	3,258	1,003	924	2,081	2,244	4,839
Japan	101	417	1,859	469,463	464,748	479,598	490,313	515,342
TOTAL . . . . .	...	531,635	542,006	469,463	464,748	479,598	490,313	515,342

(1) From United States. — (2) Including dried milk. — (3) All kinds of milk, but principally condensed milk.

changes as compared to the preceding year can be noted. In Palestine, the relatively considerable growth of imports continued.

The difference between the totals of imports and of exports can be attributed only in part to the fact that a number of countries are not entered in the table. Besides, the differences may arise also from the particular nature of the regulations for the returns by customs offices with regard to packing. The uncertainty with regard to net weight and gross weight represents a particularly troublesome obstacle. Gross weight is evidently intended when the general packing is calculated in the weight. Net weight may be intended when on the one hand the merchandize ready for sale in its container is considered and on the other

the contents alone of the container. The inclusion of the container in the weight, can thus be considered both as gross weight and as net weight.

In 1939 some countries show increases of a certain importance for dried milk, especially New Zealand and Canada. These two countries reach a record figure. The Netherlands too have had increases, which although not of great importance, compared to the preceding year, are worth mentioning particularly because

Exports of Dried Milk.

(000 lb.)

COUNTRIES	1939	1938	1937	1936	1935	1934	1933	1932
Netherlands	¹⁾ 34,893	¹⁾ 33,378	¹⁾ 42,999	¹⁾ 51,732	¹⁾ 28,226	¹⁾ 29,421	¹⁾ 32,739	¹⁾ 29,350
New Zealand	18,182	15,119	16,125	17,242	14,577	17,494	15,679	14,220
United States	^{a)} 8,358 ^{b)} 1,468	10,192 1,431	4,242 1,034	3,726 979	2,743 1,036	3,120 496	2,449 509	3,558 615
Australia	6,142	5,957	5,007	3,598	699	1,360	3,395	14,974
Canada	8,320	5,379	4,310	5,240	4,705	4,691	4,632	3,748
Ireland . . . . .	...	1,294	937	240	265	397	9	60
Denmark	1,391	725	1,008	624	227	388	503	604
TOTAL . . . . .	...	73,475	75,662	83,381	52,478	57,367	59,915	67,129

a) To foreign countries — b) To Alaska, Virgin Islands, Puerto Rico and Hawaii.

¹⁾ Net weight. — ²⁾ Gross weight.

they are in direct opposition to the considerable reduction of condensed milk. Denmark too has greatly increased her exports as compared to the preceding year, although the totals are of relatively little importance. The only reduction lies in the fact that the United States have not maintained their exports abroad at the exceptionally high level of 1938.

In general there has been no decline in the exports of dried milk as happened for condensed milk, but an increase of exports of 6,600,000 lb in round figures. The total evidently thus remains above that reported for 1936. As, however, in this total the Netherlands are included with gross weights, the real increase over 1936 must be less, unless the quantities given for 1939 may be considered as equal or greater.

As to the importation of dried milk, the European countries play a more important part in this than in that of condensed milk, the difference being explained by the different use of the two kinds of preserved milk. The United Kingdom alone takes as a rule—apart of exceptional years such as 1936—about two thirds of the imported quantities registered, or nearly one-half the exported quantities registered. Since 1935 her imports have considerably increased. Up to August 31, the imports for 1939 were reported as 24,280,000 lb. having once again slightly declined, as compared to 27,770,000 lb. imported in 1938. The Economic Union of Belgium-Luxembourg had maintained in 1939 its exports

at the high level reached in 1936. Palestine also can register a very considerable increase in imports. The United States have again almost reached, after the particularly small exports of the year 1938, the quantities imported during the years 1937 and 1935. The sudden changes in the import needs of the United

Imports of Dried Milk.

(ooo lb.)

COUNTRIES	1939	1938	1937	1936	1935	1934	1933	1932
United Kingdom		39,765	33,230	27,494	25,170	28,636	32,007	36,570
Belgo Luxemburg	8,073	7,939	7,319	8,790	2,617	1,678	2,044	1,367
France		2,161	1,938	2,130	1,980	2,630	3,567	3,896
Palestine	3,005	1,680	2,066	1,206	952	437	106	57
Hawaii ¹⁾	847	787	498	443	419	282	313	348
British Malaya	1,283	825	794	591	542	465	379	414
Canada		703	950	267	37	137	101	119
Puerto Rico ¹⁾	615	626	529	531	613	214	196	267
Mexico	589	518	677	362	207	564	494	551
Sweden		864	483	381	130	53	386	558
Panama		569	368	333	123	132	117	130
Canal Zone	377	300	225	348	245	194	170	159
Egypt	333	428	335	364	306	293	220	174
Australia	483	423	298	0	280	196	137	895
United States	2,465	82	2,806	24,460	2,743	7	562	591
TOTAL	.	57,670	52,516	67,700	36,364	35,918	40,799	46,096

¹⁾ From United States

States, which showed themselves in such a striking manner during recent years, may consequently be considered still as particularly characteristic

As a result of the war there was a heavy contraction of trade on the preserved milk market

WALTHER SCHUBRING.

CURRENT INFORMATION ON LIVESTOCK AND DERIVATIVES.

Greece Since meat can no longer be imported under satisfactory conditions, the Greek Government, in order to prevent stocks of home-grown meat from becoming exhausted, has recently passed a decree restricting the consumption of meat to two days weekly, Thursday and Sunday.

Argentina Animals are in good condition. A high yield was obtained from the second clip of sheep

Algeria Towards the end of May the situation of livestock was generally satisfactory. Lambing had been effected under good conditions.

CURRENT INFORMATION ON SERICULTURE.

Italy: The condition of the eggs was good at the end of May and the weather was favourable. Except for a few cases of disease, the condition of mulberries was also considered satisfactory at the same date

U S S R. In Central Asia, the organizations entrusted with the buying of cocoons started their campaign in the beginning of May.

According to information received concerning Uzbekistan, the most important sericultural center of the Union, the cocoon production is progressing satisfactorily this year

TRADE

The following countries do not appear on the tables, because, as a consequence of the present international situation, they have suspended the publication of trade statistics or because these data are no more regularly available: Germany, Belgio-Luxemburg E. U., Bohemia-Moravia (Protectorate), Bulgaria, Denmark, Spain, Estonia, Finland, France, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Poland and Danzig, United Kingdom, Sweden, Switzerland, Yugoslavia, U. S. S. R., Indochina, British Malaya, Syria and Lebanon, Algeria, Madagascar, French Morocco, Tunisia, Australia.

COUNTRIES	APRIL				NINE MONTHS (August 1-April 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Wheat. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Romania	2,192	1,512	0	0	16,538	19,517	0	0	27,571	0
Canada	3,049	1,699	...	...	77,086	62,502	...	...	87,746	935
United States	1,100	3,525	471	521	11,493	35,457	4,864	4,321	46,004	6,134
Argentina	9,256	9,162	—	—	76,144	39,264	—	—	70,352	—
Chile . . . . .	...	...	...	...	(4) 1	(4) 0	(4) 0	(4) 480	0	483
Uruguay . . . . .	...	...	...	...	(2) 1,221	(2) 1,795	(2) 1	(2) 6	2,413	8
India: by sea . . . . .	...	...	...	...	(3) 108	(3) 1,934	(3) 355	(3) 2,347	1,984	4,421
: by land . . . . .	...	...	...	...	(4) 188	(4) 209	(4) 50	(4) 71	443	132
Iraq	76	79	0	0	1,026	545	0	0	621	0
Iran . . . . .	...	...	...	...	(2) 0	(2) 0	(2) 0	(2) 0	0	0
Turkey	162	12	—	—	319	1,067	—	—	1,098	—
Egypt	11	0	0	26	15	1	29	53	1	60
<i>Importing Countries:</i>										
Greece	0	0	559	702	0	0	575	4,436	0	7,740
Norway . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 5,101	(1) 2,371	0	4,002
Portugal . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 311	(1) 1,224	0	1,295
Mexico . . . . .	...	...	...	...	(4) 0	(4) 0	(4) 13	(4) 130	0	1,243
Brazil . . . . .	—	—	...	...	—	—	(3) 9,322	(3) 10,808	—	23,172
Peru . . . . .	...	...	...	...	(4) 0	(4) 0	(4) 1,182	(4) 1,141	0	2,625
Burma . . . . .	...	...	...	...	(1) 6	(1) 4	(1) 59	(1) 54	7	68
Ceylon . . . . .	—	—	...	...	—	—	(1) 72	(1) 88	—	91
China . . . . .	...	...	...	...	(1) 173	(1) 197	(1) 934	(1) 2,237	511	9,597
Chosen . . . . .	...	...	...	...	(1) 24	(1) 6	(1) 56	(1) 118	6	130
Taiwan . . . . .	—	—	...	...	—	—	(2) 3	(2) 0	—	14
Japan . . . . .	—	—	...	...	—	—	(1) 1,081	(1) 259	—	679
Palestine . . . . .	...	...	...	...	(2) 0	(2) 0	(2) 406	(2) 871	0	1,791
Union of South Africa . . . . .	...	...	...	...	(4) 0	(4) 0	(4) 103	(4) 1,025	0	1,030
New Zealand . . . . .	...	...	...	...	(2) 0	(2) 0	(2) 409	(2) 812	0	2,006
Rye. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Romania	312	142	0	0	1,496	248	0	0	640	0
Canada	0	0	...	...	1,657	469	...	...	984	0
United States	50	0	0	0	345	374	0	0	374	0
Argentina	678	530	—	—	5,038*	1,053	—	—	2,064	—
Turkey	90	45	—	—	140	71	—	—	177	—
<i>Importing Countries:</i>										
Greece	0	0	0	0	0	0	0	0	0	0
Norway . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 2,110	(1) 1,804	0	2,734
Palestine . . . . .	—	—	...	...	—	—	(2) 170	(2) 104	—	188

(1) Up to March 31. — (2) Up to the end of February. — (3) Up to January 31. — (4) Up to December 31.

COUNTRIES	APRIL				NINE MONTHS (August 1-April 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Wheat Flour. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Romania	0	0	0	0	1	2	0	0	2	0
Canada	1,019	539	...	...	10,262	6,436	...	...	9,024	145
United States	836	1,499	0	0	9,663	9,421	95	106	14,059	159
Argentina	165	220	—	—	1,628	1,511	—	—	2,049	—
Uruguay	...	...	...	...	(2) 237	(2) 205	(2) 0	(2) 0	408	0
Chosen	...	...	...	...	(1) 136	(1) 380	(1) 0	(1) 0	523	0
India* by sea	...	...	...	...	(3) 699	(3) 724	(3) 2	(3) 1	1,172	4
Iraq	14	12	0	0	130	116	0	0	13	0
Iran	...	...	...	...	(2) 0	(2) 0	(2) 0	(2) 0	0	0
Japan	...	...	...	...	(1) 3,402	(1) 3,327	(1) 114	(1) 0	4,594	0
Turkey	0	10	—	—	1	62	—	—	75	—
<i>Importing Countries:</i>										
Greece	0	0	5	6	0	0	29	31	0	43
Norway	...	...	...	...	(1) 1	(1) 4	(1) 733	(1) 553	6	820
Portugal	...	...	...	...	(1) 0	(1) 0	(1) 10	(1) 31	0	38
Haiti	...	...	...	...	—	—	(2) 113	(2) 103	—	177
Mexico	...	...	...	...	(4) —	(4) 0	(4) 1	(4) 1	0	2
Brazil	...	...	...	...	—	—	(3) 403	(3) 449	—	798
Chile	...	...	...	...	(4) 0	(4) 0	(4) 33	(4) 43	2	93
Peru	...	...	...	...	(4) 0	(4) 0	(4) 19	(4) 18	0	42
Burma	...	...	...	...	(1) 1	(1) 1	(1) 504	(1) 436	1	865
Ceylon	...	...	...	...	—	—	(1) 302	(1) 256	—	366
China	...	...	...	...	(1) 739	(1) 394	(1) 3,751	(1) 3,202	1,176	7,108
Formosa	...	...	...	...	(2) 17	(2) 6	(2) 0	(2) 0	8	0
Netherlands Indies:	...	...	...	...	—	—	(2) 802	(2) 750	—	1,271
Java and Madura	—	—	...	...	—	—	(2) 551	(2) 435	—	746
Outer Provinces	...	...	...	...	(2) 0	(2) 0	(2) 145	(2) 262	0	415
Palestine	...	...	...	...	—	—	—	—	—	—
Egypt	0	0	3	4	1	0	36	38	0	46
Union of South Africa	...	...	...	...	(4) 4	(4) 1	(4) 5	(4) 4	2	9
New Zealand	...	...	...	...	(2) 0	(2) 0	(2) 0	(2) 0	0	1
Barley. — Thousand centals (1 cental = 100 lb.)										
<i>Exporting Countries:</i>										
Romania	0	273	0	0	2,329	2,891	0	0	4,195	0
Canada	103	160	...	...	5,695	6,315	...	...	7,919	1
United States	3	58	0	0	1,534	4,588	158	1	5,101	237
Argentina	922	832	—	—	8,398	3,631	—	—	4,644	—
Chile	...	...	...	...	(4) 217	(4) 310	—	—	1,076	—
India by sea	...	...	...	...	(3) 7	(3) 35	(3) 205	(3) 26	39	79
Iraq	642	566	0	0	3,286	3,285	0	0	4,573	0
Iran	...	...	...	...	(2) 90	(2) 37	(2) 0	(2) 0	97	0
Turkey	150	109	—	—	900	2,050	—	—	2,740	—
Egypt	3	0	0	2	4	68	0	18	68	19
Union of South Afr	...	...	...	...	(4) 0	(4) 0	(4) 0	(4) 0	1	0
<i>Importing Countries:</i>										
Greece	0	0	0	7	0	0	54	338	0	344
Norway	...	...	...	...	(1) 0	(1) 0	(1) 394	(1) 285	0	415
Mexico	...	...	...	...	(4) 0	(4) 0	(4) 58	(4) 67	0	146
Burma	...	...	...	...	—	—	(1) 4	(1) 3	—	4
Ceylon	...	...	...	...	—	—	(1) 7	(1) 8	—	11
Chosen	...	...	...	...	(1) 1	(1) 18	(1) 0	(1) 0	0	2
Japan	...	...	...	...	(2) 0	(2) 6	(2) 26	(2) 199	6	304
Palestine	...	...	...	...	(2) 0	(2) 0	(2) 71	(2) 40	0	216
New Zealand	...	...	...	...	—	—	—	—	—	—

(1) Up to March 31. — (2) Up to the end of February. — (3) Up to January 31 — (4) Up to December 31

COUNTRIES	APRIL				NINE MONTHS (August 1-April 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Oats. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Romania	0	0	0	0	0	0	0	0	0	0
Canada	264	146	..	...	3,607	2,200	...	...	3,265	1,134
United States	3	5	302	89	55	1,105	1,974	147	1,114	427
Argentina	847	611	—	—	7,707	4,736	—	—	5,957	—
Chile . . . . .	...	...	..	...	(4) 288	(4) 287	(4) 0	(4) 0	1,119	0
Chosen . . . . .	...	..	...	..	(1) 0	(1) 1	(1) 0	(1) 0	1	0
India: by sea . . . .	...	...	—	—	(3) 7	(3) 12	—	—	21	—
Turkey	0	22	—	—	6	165	—	—	231	—
Union of South Africa	...	..	...	...	(4) 4	(4) 2	(4) 0	(4) 0	5	2
New Zealand . . . .	...	...	...	...	(2) 0	(2) 0	(2) 13	(2) 2	4	5
<i>Importing Countries:</i>										
Greece	0	0	0	0	0	0	165	0	0	0
Norway . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 49	(1) 2	0	2
Mexico . . . . .	...	...	...	...	(4) 3	(4) 0	(4) 3	(4) 20	0	25
Peru . . . . .	..	...	...	...	—	—	(4) 10	(4) 11	—	26
Ceylon . . . . .	—	—	...	...	—	—	(1) 9	(1) 11	—	17
Egypt	—	—	0	0	—	—	0	1	—	1

Maize. — Thousand centals (1 cental = 100 lb.).

COUNTRIES	APRIL				NINE MONTHS (August 1-April 30)				TWELVE MONTHS (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Maize. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
Romania	1,703	1,198	0	0	6,575	7,308	0	0	12,014	0
United States	798	915	22	27	11,610	13,982	161	119	19,783	253
Haiti . . . . .	...	...	—	—	(2) 2	(2) 1	—	—	8	—
Dominican Republic	...	...	—	—	(2) 80	(2) 140	—	—	340	—
Argentina	7,215	6,733	—	—	28,265	28,332	—	—	74,809	—
Brazil . . . . .	...	...	—	—	(3) 365	(3) 654	—	—	1,658	—
Burma . . . . .	...	...	—	—	(1) 44	(1) 39	—	—	397	—
China . . . . .	...	...	—	—	(1) 0	(1) 26	—	—	26	—
India: by sea . . . .	...	...	—	—	(3) 0	(3) 1	—	—	1	—
Netherlands Indies:										
Java and Madura	...	...	—	—	(1) 356	(1) 832	—	—	1,353	—
Outer Provinces .	...	...	—	—	(2) 68	(2) 125	—	—	813	—
Iraq	0	0	—	—	1	1	—	—	3	—
Egypt	0	0	0	0	2	2	0	0	2	1
Union of South Africa	...	...	..	...	(1) 5,843	(1) 2,408	(4) 0	(4) 4	12,752	10
<i>Importing Countries:</i>										
Greece	0	0	76	144	0	0	306	800	0	1,336
Norway . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 1,302	(1) 1,134	0	2,647
Portugal . . . . .	...	...	...	...	(1) 0	(1) 0	(1) 140	(1) 425	0	864
Mexico . . . . .	...	...	...	...	(4) 0	(4) 0	(4) 381	(4) 0	0	807
Peru . . . . .	...	...	...	...	(4) 0	(4) 0	(4) 0	(4) 0	0	0
Chosen . . . . .	...	...	...	...	(1) 1	(1) 8	(1) 75	(1) 58	118	488
Japan . . . . .	—	—	...	...	—	—	(1) 2,545	(1) 2,357	—	6,481
Palestine . . . . .	...	...	...	...	(2) 0	(2) 0	(2) 37	(2) 45	0	160
New Zealand . . . .	...	...	...	...	(2) 0	(2) 0	(2) 17	(2) 0	0	56

(1) Up to March 31. — (2) Up to the end of February. — (3) Up to January 31. — (4) Up to December 31.

COUNTRIES	APRIL				FOUR MONTHS (January 1-April 30)				TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1940	1939	1940	1939	1939	1939
Rice. — Thousand centals (1 cental = 100 lb.).										
<i>Exporting Countries:</i>										
United States . . .	292	294	28	91	1,155	1,222	123	249	3,093	711
Mexico . . .	...	...	...	...	...	...	...	...	(3) 49	(2) 0
Brazil . . .	...	...	...	...	(3) 80	(3) 95	...	...	1,332	...
Burma . . .	...	...	...	...	(1) 19,456	(1) 25,504	(1) 5	(1) 7	75,481	26
Chosen . . .	...	...	...	...	...	...	...	...	2,220	0
Taiwan . . .	...	...	...	...	(2) 15	(2) 32	(2) 0	(2) 0	296	0
Iraq . . .	0	2	0	0	0	10	0	0	15	1
Iran . . .	...	...	...	...	(2) 1	(2) 0	(2) 1	(2) 3	0	18
Thailand (Siam) . . .	...	...	...	...	(2) 6,210	(2) 6,173	...	...	41,010	...
Egypt . . .	747	196	0	0	2,033	1,081	0	1	2,579	2
<i>Importing Countries:</i>										
Greece . . .	0	0	8	71	0	0	254	241	0	647
Norway . . .	...	...	...	...	...	...	(1) 55	(1) 27	6	160
Portugal . . .	...	...	...	...	(1) 0	(1) 0	(1) 5	(1) 8	0	104
Romania . . .	...	...	16	33	...	...	156	151	...	360
Haiti . . .	...	...	...	...	...	...	(2) 1	(2) 1	...	11
Argentina . . .	...	...	...	...	(1) 0	(1) 1	(1) 18	(1) 153	2	679
Chile . . .	...	...	...	...	...	...	...	...	...	187
Peru . . .	...	...	...	...	...	...	...	...	2	463
Ceylon . . .	...	...	...	...	(1) 1	(1) 0	(1) 3,615	(1) 3,691	3	13,391
China . . .	...	...	...	...	(1) 5	(1) 129	(1) 4,317	(1) 1,563	156	7,060
India: by sea . . .	...	...	...	...	(3) 386	(3) 407	(3) 3,187	(3) 2,670	6,343	51,294
" by land . . .	...	...	...	...	...	...	...	...	424	1,648
Netherlands Indies:	...	...	...	...	...	...	...	...	...	...
Java and Madura . . .	...	...	...	...	(1) 72	(1) 17	(1) 60	(1) 0	258	729
Outer Provinces . . .	...	...	...	...	(2) 0	(2) 33	(2) 298	(2) 835	214	5,372
Japan . . .	...	...	...	...	(1) 0	(1) 52	(1) 0	(1) 143	444	965
Palestine . . .	...	...	...	...	(2) 7	(2) 23	(2) 81	(2) 85	85	562
Union of Sout Afr. . .	...	...	...	...	...	...	...	...	0	1,751
New Zealand . . .	...	...	...	...	(2) 0	(2) 0	(2) 14	(2) 14	0	41
<i>Exporting Countries:</i>										
Romania . . .	0	0	4	0	0	1	4	2	3	2
Argentina . . .	2,148	1,654	...	...	11,371	12,743	...	...	26,082	...
Uruguay . . .	...	...	...	...	(2) 442	(2) 345	...	...	2,403	...
China . . .	...	...	...	...	(1) 0	(1) 14	...	...	99	...
India: by sea . . .	...	...	...	...	(3) 206	(3) 510	(3) 0	(3) 0	5,934	...
" by land . . .	...	...	...	...	...	...	...	...	63	...
Iraq . . .	0	1	...	...	6	10	...	...	202	...
Egypt . . .	2	0	0	0	8	0	0	0	2	1
New Zealand . . .	...	...	...	...	(2) 1	(2) 1	(2) 0	(2) 0	2	0
<i>Importing Countries:</i>										
Greece . . .	0	0	9	5	0	0	23	18	0	71
Norway . . .	...	...	...	...	(1) 0	(1) 0	(1) 191	(1) 180	0	513
United States . . .	...	...	672	793	...	...	3,356	4,372	...	8,976
Burma . . .	...	...	...	...	(1) 0	(1) 0	(1) 0	(1) 0	0	0
Japan . . .	...	...	...	...	(1) 0	(1) 0	(1) 29	(1) 27	0	52
Palestine . . .	...	...	...	...	...	...	1	6	...	24

(1) Up to March 31. — (2) Up to the end of February. — (3) Up to January 31.

COUNTRIES	APRIL				NINE MONTHS (August 1-April 30)				(TWELVE MONTHS) (August 1-July 31)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39

Cotton. — Thousand centals (1 cental = 100 lb.).

Exporting Countries:

United States . . .	1,836	934	56	63	30,114	15,653	616	541	17,562	749
Haiti . . .	...	...	—	—	(2) 12	(2) 20	—	—	104	—
Mexico . . .	...	...	—	—	(4) 35	(4) 177	(4) 11	(4) 3	308	9
Dominican Republic . .	...	...	—	—	(2) 0	(2) 2	—	—	5	—
Argentina . . .	35	0	—	—	364	349	—	—	555	—
Brazil . . .	...	...	—	—	(3) 2,147	(3) 2,822	—	—	7,692	—
Peru . . .	...	...	—	—	(4) 883	(4) 982	—	—	1,801	—
Burma . . .	...	...	—	—	(1) 285	(1) 267	(1) 0	(1) 0	385	0
China . . .	...	...	—	—	(1) 78	(1) 1,245	(1) 3,073	(1) 1,098	1,305	3,698
India: by sea . . .	...	...	—	—	(3) 4,350	(3) 5,018	(3) 912	(3) 724	12,898	1,685
N. I: Java & Mad. . .	...	...	—	—	(1) 2	(1) 10	—	—	15	—
Outer provinces . . .	...	...	—	—	(2) 21	(2) 12	—	—	53	2
Iraq . . .	5	1	0	0	57	46	1	1	223	0
Iran . . .	...	...	—	—	(2) 200	(2) 73	(2) 0	(2) 0	385	—
Turkey . . .	7	18	—	—	94	304	—	—	8,429	—
Egypt . . .	633	866	—	—	6,703	6,580	—	—	—	—

Importing Countries:

Greece . . .	0	0	8	6	0	0	45	33	0	49
Norway . . .	...	...	—	—	(1) 0	(1) 0	(1) 94	(1) 70	0	88
Portugal . . .	...	...	—	—	—	—	(1) 362	(1) 345	—	474
Romania . . .	0	0	27	19	0	0	265	339	0	433
Ceylon . . .	...	...	—	—	(1) 0	(1) 0	(1) 19	(1) 12	0	17
Chosen . . .	...	...	—	—	(1) 270	(1) 193	(1) 197	(1) 250	193	348
Japan . . .	...	...	—	—	(1) 0	(1) 0	(1) 8,543	(1) 8,766	1	13,176
Palestine . . .	...	...	—	—	(2) 1	(2) 0	(2) 12	(2) 8	0	16
Union of South Afr. . .	...	...	—	—	(4) 0	(4) 3	(4) 7	(4) 6	3	13

Wool. — Thousand lb.

EIGHT MONTHS (September 1-April 30)

TWELVE MONTHS
(Sept 1-Oct. 31)

Exporting Countries:

Argentina . . . (a)	24,017	27,282	—	—	164,485	223,307	—	—	299,148	—
Chile . . . (b)	10,450	5,205	—	—	54,776	38,248	—	—	56,745	—
Peru . . .	...	...	—	—	(4) 351	(4) 5,556	(4) 73	(4) 302	30,838	461
Uruguay . . . (a)	...	...	—	—	(4) 5,035	(4) 3,635	—	—	12,022	—
Burma . . . (b)	...	...	—	—	(2) 44,441	(2) 45,310	—	—	95,932	—
China . . .	...	...	—	—	(2) 11,984	(2) 9,718	—	—	24,306	—
India: by sea . . .	...	...	—	—	(1) 150	(1) 170	(1) 0	(1) 0	311	0
India: by land . . .	...	...	—	—	(1) 511	(1) 5,633	—	—	6,671	—
Iraq . . .	952	683	0	0	(3) 28,127	(3) 34,683	(3) 2,088	(3) 2,771	76,997	8,031
Iran . . .	...	...	—	—	—	—	(4) 6,850	(4) 5,445	—	20,102
Palestine . . .	...	...	—	—	11,303	12,763	37	15	19,672	57
Turkey . . . (a)	...	...	—	—	(2) 7,635	(2) 2,004	(2) 0	(2) 0	6,151	0
Egypt . . . (b)	134	846	—	—	(2) 46	(2) 60	(2) 9	(2) 15	181	40
Un. of S. Africa . . .	326	403	62	20	5,472	12,765	—	—	21,272	—
New Zealand . . . (a)	...	...	—	—	2,588	3,338	317	251	5,176	465
Japan . . . (b)	...	...	—	—	(1) 116,072	(1) 183,785	(4) 75	(4) 747	234,846	1,058
...	...	...	—	—	(1) 6,041	(1) 4,449	(4) 437	(4) 509	7,994	1,587
...	...	...	—	—	(2) 79,653	(2) 108,051	(2) 73	(2) 46	254,591	55
...	...	...	—	—	(2) 4,504	(2) 17,566	(2) 0	(2) 4	57,270	4

Importing Countries:

Greece . . .	18	57	915	562	395	860	2,881	4,158	2,103	7,657
Norway . . .	...	...	—	—	(1) 602	(1) 1,043	(1) 2,339	(1) 1,605	1,689	2,668
Portugal . . .	...	...	—	—	(1) 2,035	(1) 827	(1) 948	(1) 1,982	2,251	3,318
Romania . . .	0	0	57	55	0	18	143	686	62	840
United States . . .	430	0	22,066	16,826	540	267	241,290	145,598	417	209,676
Mexico . . .	...	...	—	—	(4) 0	(4) 0	(4) 1,559	(4) 1,398	139	4,837
Japan . . .	...	...	—	—	(2) 0	(2) 0	(2) 50,709	(2) 61,337	0	107,551

(a) Unwashed wool. — (b) Washed wool. — (1) Up to March 31. — (2) Up to the end of February. — (3) Up to January 31. — (4) Up to December 31.

COUNTRIES	APRIL				FOUR MONTHS (January 1-April 30)								TWELVE MONTHS (January 1-Dec. 31)	
	EXPORTS		IMPORTS		EXPORTS				IMPORTS				EXPORTS	IMPORTS
	1940	1939	1940	1939	1940	1939	1940	1939	1940	1939	1939	1939		
Butter. — Thousand lb.														
Exporting Countries :														
Norway	...	...	...	...	(1) 42	(1) 117	(1) 0	(1) 0	...	...	126	0
Portugal.	...	...	...	...	(1) 31	(1) 29	(1) 0	(1) 0	...	...	157	0
Romania	2	35	0	0	236	143	...	...	...	...	935	0
Argentina	1,052	712	—	—	9,645	6,823	—	—	...	...	19,745	—
Union of South Afr	...	...	...	...	...	...	...	...	...	...	6,929	24
New Zealand	...	...	...	...	(2) 57,437	(2) 54,807	(2) ...	(2) ...	...	...	274,258	2
Importing Countries :														
Greece	—	—	26	88	—	—	73	373	—	—	1,074	—		
Mexico	—	—	...	...	—	—	...	...	2 308	—	1,107	—
United States	172	207	123	44	851	615	421	328	—	0	134	—		
Peru	...	...	...	...	...	...	...	...	...	...	335	—
Burma	...	...	...	...	...	...	(1) 163	(1) 181	—	—	719	—
Ceylon	...	...	...	...	...	...	(1) 220	(1) 227	—	—	1,109	—
China	...	...	...	...	...	...	(1) 137	(1) 110	—	—	593	—
India : by sea	...	...	...	...	(3) 562	(3) 509	(3) 99	(3) 110	5,785	1,065	—	—
India : by land	—	—	...	...	—	—	...	...	—	—	5,247	—
Netherlands Indies :	—	—	...	...	—	—	...	...	—	—	—	—
Java and Madura	—	—	...	...	—	—	(2) 972	(2) 968	—	—	6,698	—
Outer Provinces	—	—	...	...	—	—	(2) 353	(2) 342	—	—	2,588	—
Iraq	0	0	0	7	0	2	11	15	2	40	—	—		
Iran	...	...	...	...	(2) 2	(2) 2	(2) 13	(2) 37	4	185	—	—
Palestine	...	...	...	...	(2) 0	(2) 0	(2) 791	(2) 888	2	4 389	—	—
Egypt	0	20	51	71	24	143	351	280	265	871	—	—		
Cheese. — Thousand lb.														
Exporting Countries :														
Norway	...	...	...	...	(1) 908	(1) 1,217	(1) 106	(1) 179	3,966	648	...	...
Romania	0	2	0	7	86	57	15	31	392	57	...	...
Argentina	489	450	—	—	1,466	1,497	—	—	5,474	84	...	...
Union of South Afr.	...	...	...	...	...	...	...	...	4,253	282	...	...
New Zealand	...	...	...	...	(2) 43,969	(2) 36,597	(2) 0	(2) 2	187,166	2	...	...
Importing Countries :														
Greece	77	15	439	432	287	24	668	1,545	95	2,202	...	...
Portugal	...	...	...	...	(1) 68	(1) 62	(1) 11	(1) 24	216	201	...	...
United States	152	130	3,552	3,926	613	470	13,547	17,148	1,479	59,075	...	...
Mexico	...	...	...	...	...	...	...	...	7	904	...	...
Chile	...	...	...	...	...	...	...	...	9	97	...	...
Peru	...	...	...	...	...	...	...	...	2	721	...	...
Burma	—	—	...	...	—	—	(1) 24	(1) 33	—	97	...	...
Ceylon	—	—	...	...	—	—	(1) 66	(1) 44	—	194	...	...
India : by sea	...	...	...	...	(3) 0	(3) 0	(3) 185	(3) 101	4	992	...	...
Netherlands Indies :	—	—	...	...	—	—	(2) 269	(2) 218	—	2,011	...	...
Java and Madura	—	—	...	...	—	—	(2) 18	(2) 35	15	60	...	...
Iraq	0	2	2	4	0	9	141	(2) 377	20	2,077	...	...
Palestine	...	...	...	...	(2) 2	(2) 2	(2) 141	(2) 377	64	5,315	...	...
Egypt	0	11	311	485	11	37	1,581	1,755	—	—	...	...

(1) Up to March 31. — (2) Up to the end of February. — (3) Up to January 31.

COUNTRIES	APRIL				SEVEN MONTHS (October 1-April 30)				TWELVE MONTHS (Oct. 1-Sept. 30)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Cacao. — Thousand lb.										
<i>Exporting Countries:</i>										
Haiti	—	—	(2) 1,682	(2) 2,811	—	—	3,979	—
Dominican Republic	—	—	(1) 15,977	(1) 26,206	—	—	63,690	—
Brazil	—	—	(3) 87,782	(3) 117,564	—	—	303,317	—
Ecuador	—	—	(3) 4,893	(3) 9,385	—	—	36,174	—
Trinidad	—	—	(1) 13,973	(1) 9,218	—	—	17,921	—
Ceylon	—	—	(1) 6,638	(2) 4,372	—	—	7,754	—
Java and Madura	—	—	(1) 1,199	(1) 1,773	—	—	3,098	—
Belgian Congo	—	—	(3) 818	(3) 1,041	—	—	2,806	—
Gold Coast	40,043	53,762	—	—	299,850	492,316	—	—	643,415	—
Nigeria & Cameroon	21,464	21,969	—	—	104,257	202,881	—	—	259,104	—
São Thomé and Príncipe Islands	—	—	(1) 13,889	(1) 13,775	—	—	23,202	—
<i>Importing Countries:</i>										
Greece	0	0	33	247	2	0	977	2,482	0	4,101
Norway	(1) 0	(1) 0	(1) 5,016	(1) 4,471	0	8,186
Portugal	(1) 2	(1) 0	(1) 789	(1) 646	2	1,215
Romania	119	254	—	—	1,519	2,608	—	3,783
United States	26,623	71,798	—	—	343,243	368,530	—	583,184
Argentina	—	—	(1) 5,313	(1) 4,725	—	10,966
Uruguay	—	—	(2) 522	(2) 509	—	1,334
Palestine	—	—	(2) 406	(2) 348	—	1,451
Egypt	198	11	—	—	1,248	593	—	639
Union of South Africa	—	—	(4) 518	(4) 635	—	2,377
New Zealand	—	—	(2) 2,976	(2) 1,451	—	4,191
Coffee. — Thousand lb.										
TEN MONTHS (July 1-April 30)										
<i>Exporting Countries:</i>									TWELVE MONTHS (July 1-June 30)	
Costa-Rica	—	—	—	—	(1) 18,726	(2) 30,572	—	—	45,429	—
Guatemala	—	—	(2) 63,359	(1) 68,220	—	—	86,988	—
Haiti	—	—	(2) 33,100	(2) 38,951	—	—	64,854	—
Jamaica	—	—	(1) 4,354	(1) 6,047	—	—	9,808	—
Mexico	—	—	(4) 20,256	(4) 22,728	—	—	79,766	—
Nicaragua	—	—	(2) 14,842	(2) 12,668	—	—	40,305	—
Dominican Republic	—	—	(2) 12,516	(2) 14,094	—	—	30,459	—
Salvador	—	—	(2) 53,769	(2) 68,531	—	—	130,792	—
Brazil	—	—	(1) 1,610,434	(1) 1,587,107	—	—	2,155,720	—
Colombia	40,102	37,679	—	—	397,892	433,895	—	—	537,290	—
Ecuador	—	—	(2) 24,723	(2) 24,899	—	—	31,326	—
Netherlands Guyana	—	—	(4) 3,351	(4) 3,272	—	—	5,404	—
Peru	(4) 4,658	(4) 3,812	(4) 0	(4) 2	6,546	4
Venezuela	—	—	(1) 31,348	(1) 51,176	—	—	69,781	—
Aden: by sea	—	—	(2) 8,358	(2) 7,319	—	—	11,380	—
India: by sea	(3) 5,966	(3) 6,169	(3) 0	(3) 0	23,155	7
N. I: Java & Mad.	(1) 49,617	(1) 42,362	—	—	55,202	—
Outer Provinces	—	—	(2) 53,647	(2) 78,851	—	—	106,993	—
Belgian Congo	—	—	(3) 20,192	(3) 23,909	—	—	45,285	—
Kenia	—	—	(4) 13,274	(4) 14,220	—	—	38,142	—
Uganda	—	—	(4) 21,385	(4) 17,472	—	—	35,084	—
Tanganyika	—	—	(4) 27,005	(4) 19,659	—	—	30,622	—
<i>Importing Countries:</i>										
Greece	—	—	1,091	725	—	—	9,158	10,644	—	13,018
Norway	(1) 7	(1) 88	(1) 32,838	(1) 29,269	104	44,174
Portugal	(1) 2,487	(1) 1,310	(1) 13,532	(1) 9,883	1,903	13,716
Romania	408	522	—	—	4,782	6,709	—	8,025
United States	844	767	168,152	134,242	10,421	8,128	1,705,012	1,636,616	10,598	1,965,955
Argentina	—	—	(1) 43,098	(1) 39,231	—	50,892
Chile	—	—	(4) 6,334	(4) 3,521	—	6,967
Uruguay	—	—	(2) 3,338	(2) 3,752	—	5,540
Burma	(1) 1,060	(1) 88	(1) 423	(1) 231	269	302
Ceylon	(1) 7	(1) 0	(1) 2,363	(1) 2,456	2	3,170
Iraq	0	0	273	315	0	0	2,357	1,878	0	2,588
Japan	(1) 29	(1) 276	(1) 3,051	(1) 4,998	326	6,279
Palestine	(2) 4	(2) 0	(2) 2,709	(2) 1,845	0	3,624
Turkey	1,025	1,294	—	—	11,947	10,051	—	12,260
Egypt	1,477	1,195	—	—	13,276	9,795	—	12,081
Union of South Afr.	(4) 90	(4) 11	(4) 23,764	(4) 18,583	24	33,193
New Zealand	(2) 0	(2) 0	(2) 306	(2) 351	0	569

(1) Up to March. 31. — (2) Up to the end of February. — (3) Up to January 31. — (4) Up to December 31.

COUNTRIES	APRIL				TEN MONTHS (July 1-April 30)				TWELVE MONTHS (July 1-June 30)	
	EXPORTS		IMPORTS		EXPORTS		IMPORTS		EXPORTS	IMPORTS
	1940	1939	1940	1939	1939-40	1938-39	1939-40	1938-39	1938-39	1938-39
Tea. — Thousand lb.										
<i>Exporting Countries:</i>										
Ceylon	(1) 155,739	(1) 159,611	(1) 0	(1) 0	231,627	0
China	(1) 66,090	(1) 76,853	(1) 11,325	(1) 3,212	83,388	7,015
Taiwan	(2) 13,301	(2) 18,541	(2) 0	(2) 0	20,435	0
India: by sea	(3) 284,565	(3) 286,895	(3) 950	(3) 2,604	332,857	4,722
" by land	(4) 6,043	(4) 7,035	—	—	13,728	—
N I: Java & Mad.	(1) 95,472	(1) 93,373	(2) 271	(2) 392	127,258	483
Outer Provinces	(2) 19,731	(2) 21,078	—	—	32,428	—
Japan	(1) 45,638	(1) 28,817	(1) 1,409	(1) 86	35,023	130
<i>Importing Countries:</i>										
Greece	—	—	2	13	—	—	216	357	—	414
Norway	(1) 0	(1) 0	(1) 542	(1) 284	0	397
Portugal	—	—	(1) 262	(1) 234	—	317
Romania	13	18	—	—	608	659	—	800
United States	8,631	6,865	—	—	88,644	74,091	—	89,601
Argentina	—	—	(1) 3,999	(1) 3,821	—	4,802
Chile	—	—	(1) 2,518	(1) 3,170	—	6,792
Peru	—	—	(4) 503	(4) 595	—	1,074
Uruguay	—	—	(2) 320	(2) 342	—	450
Burma	(1) 617	(1) 132	(1) 1,651	(1) 1,455	163	2,255
Iraq	0	11	877	522	7	71	5,545	5,994	71	7,300
Iran	(2) 0	(2) 0	(2) 10,664	(2) 11,526	0	17,785
Palestine	(2) 11	(2) 0	(2) 503	(2) 888	0	675
Turkey	0	187	—	—	1,030	1,801	—	2,174
Egypt	1,250	1,250	—	—	13,664	13,730	—	16,535
Union of South Afr.	(1) 278	(1) 227	(1) 10,646	(1) 8,655	659	16,865
New Zealand	(1) 88	(1) 86	(1) 8,523	(1) 7,868	165	11,407

Total Wheat and Flour †. — Thousand cents (1 cental = 100 lb.).

	APRIL		NINE MONTHS (August 1-April 30)		TWELVE MONTHS (August 1-July 31)	
	NET EXPORTS (*)	NET IMPORTS (**)	NET EXPORTS (*)	NET IMPORTS (**)	N. EX. (*)	N. IMP. (**)
Greece	—	565	—	4,614	—	7,797
Norway	—	...	—	(1) 6,077	—	5,087
Portugal	—	...	—	(1) 324	—	1,345
Romania	2,192	1,514	16,539	19,520	—	27,574
Canada	4,408	2,408	90,741	70,271	—	98,650
United States	1,743	5,002	19,386	43,556	—	58,402
Haiti	—	...	—	(2) 151	—	236
Mexico	—	...	—	(4) 15	—	1,246
Argentina	9,477	9,455	78,314	41,279	73,103	—
Brazil	—	...	—	(3) 9,860	—	24,236
Chile	—	...	—	(4) 44	—	604
Peru	—	...	—	(1) 1,207	—	2,681
Uruguay	—	...	(2) 1,536	(2) 2,061	2,948	—
Burma	—	...	—	(1) 724	—	1,212
Ceylon	—	...	—	(1) 475	—	579
China	—	...	—	(1) 4,777	—	16,996
Chosen	—	...	(1) 150	(1) 394	573	—
Taiwan	—	...	(2) 19	(2) 8	—	3
India: by sea	—	...	(3) 683	(3) 551	—	881
" by land	—	...	(4) 138	(4) 138	311	—
N I: Java & Mad.	—	...	—	(2) 1,069	—	1,695
Outer Provinces	—	...	—	(2) 735	—	994
Iraq	94	95	1,199	698	825	—
Iran	—	...	—	(2) 0	—	0
Japan	—	...	(1) 3,303	(1) 4,176	5,445	—
Palestine	—	...	—	(2) 866	—	2,345
Turkey	162	25	321	1,149	1,198	—
Egypt	7	—	—	61	—	119
Union of South Afr.	—	...	—	(4) 105	—	1,040
New Zealand	—	...	—	(2) 409	—	2,007

(*) Excess of exports over imports. — (**) Excess of imports over exports.

†) Flour reduced to grain on the basis of the coefficient: 1,000 centals of flour = 1,333.333 centals of grain

(1) Up to 31 March. — (2) Up to the end of February. — (3) Up to January 31. — (4) Up to December 31

STOCKS ***Commercial cereals in store in Canada and the United States.**

PRODUCTS AND LOCATION	Friday or Saturday nearest 1st of month ⁽¹⁾				
	June 1940	May 1940	April 1940	June 1939	June 1938
	thousand cents				
WHEAT:					
Canadian in Canada . . . . .	...	170,590	173,035	67,792	17,353
U. S. in Canada . . . . .	...	420	487	581	634
U. S. in the United States	58,602	63,357	63,241	38,507	18,797
Canadian in the United States	12,296	10,321	13,415	1,382	409
TOTAL . . . . .	...	244,688	250,178	108,262	37,193
RYE:					
Canadian in Canada . . . . .	...	1,776	1,750	1,373	631
U. S. in Canada . . . . .	...	13	13	13	62
U. S. in the United States	5,551	5,627	5,617	3,815	987
Canadian in the United States	1,527	701	629	67	0
TOTAL . . . . .	...	8,117	8,069	5,268	1,680
BARLEY:					
Canadian in Canada . . . . .	...	3,983	4,144	3,029	2,890
U. S. in Canada . . . . .	...	0	1	21	106
U. S. in the United States	4,228	5,200	6,693	2,758	2,405
Canadian in the United States	666	587	610	71	0
TOTAL . . . . .	...	9,770	11,448	5,879	5,401
OATS					
Canadian in Canada . . . . .	...	3,742	4,035	2,778	1,462
U. S. in Canada . . . . .	...	21	38	45	309
U. S. in the United States	1,478	1,985	2,412	2,171	2,875
Canadian in the United States	142	62	137	0	0
TOTAL . . . . .	...	5,810	6,622	4,994	4,646
MAIZE					
U. S. in Canada . . . . .	...	802	396	1,049	4,893
Argentine in Canada . . . . .	...	0	0	12	82
South African in Canada . . . . .	...	447	560	247	533
Australian in Canada . . . . .	...	0	0	45	0
U. S. in the United States	13,449	19,120	22,234	19,358	13,859
TOTAL . . . . .	...	20,369	23,190	20,711	19,367

(1) Friday for Canada, Saturday for the United States.

Commercial cereals and oilseeds in store in Argentina.

PRODUCTS AND LOCATION	First day of month				
	June 1940	May 1940	April 1940	June 1939	June 1938
	thousand cents				
Wheat	¹⁾ 67,721	¹⁾ 75,532	—	36,183
Rye	5,042	5,293	1,651	203
Barley	5,334	5,990	2,305	1,491
Oats	4,043	4,758	4,155	2,750
Maize in the ports	2,574	1,263	3,013	671
Maize in other positions	4,151	1,106	5,338	2,514
TOTAL	6,725	2,369	8,351	3,185
Canaryseed	539	520	301	297
Linseed in the ports	4,510	5,024	5,473	4,665
Linseed in other positions	3,477	3,961	3,829	4,883
TOTAL	7,987	8,985	9,302	9,548
Sunflowerseed	634	186	801	—

⁽¹⁾ Of which 30,622 thousand cents of 1939-40 crop. — ⁽¹⁾ Of which 29,202 thousand cents of 1939-40 crop.

* Stocks of rye and barley in the United States, see on page 448.

Wheat and wheat-flour in the Union of South Africa.

LOCATION	Last day of month				
	April 1940	March 1940	February 1940	April 1939	April 1938
	thousand centals				
Wheat held by millers:					
South African	3,131	3,438	3,251	4,170	3,774
Imported	19	25	29	21	4
Wheat held by co operatives	621	716	1,041	705	305
TOTAL	3,771	4,179	4,321	4,896	3,683
Wheat-flour and boermeal ⁽¹⁾ held by millers	275	269	284	269	235
Grand total ⁽²⁾	4,153	4,552	4,716	5,257	3,996

(1) 140 lb. of wheat flour or 165 lb. of boermeal correspond to 200 lb. of wheat. — (2) Including flour in terms of grain.

Cotton stocks on hand in the United States.

LOCATION	Last day of month				
	May 1940	April 1940	March 1940	May 1939	May 1938
	thousand centals				
In consuming establishments	6,458	7,225	7,846	5,774	7,852
In public storage and at compresses	49,623	52,841	56,103	61,089	49,949
TOTAL	55,081	60,076	63,949	66,863	57,801

Cotton stocks at Bombay, Alexandria and Port Sudan.

LOCATION	Thursday nearest 1st of month ⁽¹⁾				
	May 1940	April 1940	March 1940	May 1939	May 1938
	thousand centals				
Bombay ⁽²⁾	4,745	4,167	4,479	4,615
Alexandria ⁽³⁾	2,181	2,403	2,645	2,550	2,063
Port Sudan . . . . .	...	690	438	602	806

⁽¹⁾ Stocks held by exporters, dealers and millers. — ⁽²⁾ Quantities consumed in Alexandria, or returned to the interior of the country, are not included. — ⁽³⁾ For Port Sudan the data refer to the last day of the preceding month.

AUTHORITIES: East Indian Cotton Assn. and Commission de la Bourse de Minet-el-Bassal.

PRICES**PRICES BY PRODUCTS (¹)**

All quotations are spot, on Fridays, unless otherwise stated. The monthly averages are based on the Friday quotations, and the yearly averages on the monthly.

DESCRIPTION	June	May	May	May	AVERAGE					Commercial	
	7	31	24	7	May	June	June	Season (1)			
	1940	1940	1940	1940	1940	1939	1938	1938-39	1937-38		
Wheat											
Budapest: Tisza wheat, 78 kg per hl. (pengő per quintal)	20.75	20.75	20.75	20.75	*) 20.75	19.93	24.90	20.42	21.44		
Bralla: Home-grown, good qual. (lei p. ql.)	625	n. q.	630	640	630	413	565	411	520		
Winnipeg: No. 1 Manitoba (cents p. 60 lb.)	75	73 1/2	71	70 1/2	78	62 1/2	112 1/2	62	131 1/2		
Chicago: No. 2 Hard Winter (cents p. 60 lb.)	83 3/4	85 1/2	85 1/2	91 1/2	96 1/2 n.	75 1/2	81	70 1/2	96 1/2		
Minneapolis (cents per 60 lb.):											
No. 1 Northern	82 1/2	82 1/2	84 1/2	86 1/2	93 1/2	80 1/2	90 1/2	74 1/2	104 1/2		
No. 2 Amber Durum	68 1/2	69 1/2	70 1/2	72 1/2	79 1/2	74 1/2	80 1/2	68 1/2	93 1/2		
New York: No. 2 Hard Winter (f.o.b. cents per 60 lb.)	100 1/2	101 1/2	103 1/2	109 1/2	115	94	98 1/2	84 1/2	112 1/2		
Buenos Aires (a): No. 2 Hard, 80 kg. per hl. (paper pesos per quintal)	*) 8.62	8.55	8.35	8.35	8.80	7.00	9.36	6.89	12.20		
Karachi: White Karachi, 2% barley, 1 1/2% impurities (rupees per 656 lb.)	...	...	...	...	*29-12-0	22-15-7	22-0-0	22-12-8	26-15-9		
London, Mark Lane: English (sh. per 504 lb.; at farm)	*) 31/6	*) 31/6	*) 31/6	*) 31/6	*) 31/6	21/1 1/2	36/-	20/7 1/2	37/7 1/2		
London, Baltic (f.o.b., parcels; sh. per 480 lb.):											
No. 1 Northern Manitoba (St. John)	...	*) 31/4 1/2	*) 30/3	*) 31/6	*) 31/0 1/2	—	—	—	—		
No. 1 Northern Manitoba (Pacific)	...	n. q.	n. q.	27/6	* 30/8	—	—	—	—		
Barusso, 62 lb p. hl.	...	27/3	27/6	28/6	28/7 1/2	—	—	—	—		
Australian	...	27/3	27/-	27/3	27/3 1/2	—	—	—	—		
Rye.											
Budapest: Pest rye (pengő p. quintal)	16.72	16.72	16.72	16.72	16.72	13.24	17.79	14.34	18.57		
Winnipeg: No. 2 rye (cents p. 56 lb.)	...	50 1/2	46	49 1/2	57 1/2	44 1/2	52 1/2	40 1/2	72 1/2		
Minneapolis: No. 2 rye (cents p. 56 lb.)	46 1/2	46 1/2	48	49 1/2	57	49 1/2	55 1/2	44	67 1/2		
Barley.											
Bralla: Average quality (lei p. quintal).	n. q.	460	460	460	458	359	383	338	365		
Winnipeg: No. 4 West. (cents p. 48 lb.) (*)	...	32 1/2	31 1/2	33 1/2	37 1/2	34	51	34 1/2	56 1/2		
Chicago: Feeding (on sample; cents p. 48 lb.)	45	45	45	45	45	42 1/2	43 1/2	40 1/2	51 1/2		
Minneapolis: No. 2 Feeding (cents p. 48 lb.)	44	46	46 1/2	47 1/2	48 1/2	45 1/2	46 1/2	40 1/2	53 1/2		
London, Mark Lane: English malting (sh. per 448 lb.; at farm)	67/6	67/6	67/6	67/6	68/6	n.* 35/-	46/6	36/1	53/-		
London, Baltic (f.o.b. St. John, parcels; sh. per 400 lb.):											
No. 1 Australian Chevalier (p. 448 lb.)	...	29/6	29/6	29/6	29/4 1/2	—	—	—	—		
Oats.											
Winnipeg: No. 2 White (cents per 34 lb.)	...	32 1/2	32 1/2	32 1/2	35	30	45 1/2	29	50 1/2		
Chicago: No. 2 White (cents per 32 lb.)	36 1/2	38 1/2	38	39 1/2	40	35	29 1/2	30 1/2	32 1/2		
Buenos Aires (a). No. 2 White, 49 kg. per hl. (paper pesos p. quintal)	*) 4.98	5.00	5.05	5.00	5.15	4.32	6.06	4.81	6.32		
London, Mark Lane: English white (sh. per 336 lb.; at farm)	*) 36/-	*) 36/-	*) 36/-	*) 36/-	*) 36/-	19/7 1/2	26/2 1/2	19/3 1/2	26/6 1/2		
Milano (b) (lire per quintal):											
Home-grown	162.50	162.50	162.50	162.50	162.50	101.35	101.25	98.00	100.05		
Foreign	n. q.	n. q.	n. q.	n. q.	n. q.	102.50	101.25	95.90	97.15		

* Indicates that the product was not quoted during part of the period under review. — n. q. = not quoted. — n. = nominal — (a) Thursday prices. — (b) Saturday prices.

(¹) In relation to Government price fixing, numerous series are omitted from this table; notes concerning them have been given in various issues of the Crop Report: United Kingdom: Nov. 1939, p. 2060; Italy: Dec. 1939, p. 1163; Germany: Feb. 1940, p. 142; — (²) August-July. — (³) As from Sept. 22, 1939: No. 2 Feeding barley. — (⁴) Revised prices: May 3 and 10: 20 75. — (⁵) June futures. — (⁶) Fixed maximum price; prices of seed wheat and seed oats which are not under control, are much higher. — (⁷) Shipping August 1-15, f.o.b. Montreal.

DESCRIPTION	June	May	May	May	AVERAGE			
	7	31	24	17	May	June	June	Commercial
	1940	1940	1940	1940	1940	1939	1938	Season 1)
								1939-40 1938-39
Maize.								
Bralla: Average quality (lei p. quintal). . .	520	520	525	530	525	* 400	345	365 362
Chicago: No. 3 Yellow (cents p. 56 lb.). .	65 1/4	64 1/2	65	65 1/2	66 3/4	50 1/4	57 1/4	53 1/4 51 1/2
Buenos Aires (a): Yellow Plata (paper pesos per quintal)	*) 4.11	3.95	4.05	4.25	4.27	6.29	7.40	6.11 6.11
London, Baltic (f.o.b., parcels; sh per 480 lb):								
No. 2 Yellow American (Baltimore) . . .	...	n. q.	n. q.	n. q.	n. q.	—	—	29 7 1/2 19 7
Yellow Plata . . . . .	...	12/4 1/2	12/9	13/-	13/3	—	—	—
Rice (milled).								
								1939 1938
Rangoon (delivery current month, rupees per 7500 lb):								
No. 2 Europe (Burma) . . . . .	...	...	...	...	...	248-2	259-12	255- 2 255-12
Kanungtoe, small mills specials . . . .	...	...	...	...	...	230-2	232-2	231- 9 219-12
Big mills specials . . . . .	...	...	...	...	...	223-12	217-8	226-14 207- 0
London (a) shipping current or following month; sh. p. cwt.):								
No. 2 Burma (c.i.f. U. K.) (*) . . . .	...	15/-	14/9	15/-	*14/11	8/1 1/4	8/6 1/4	* 7/8 1/4 8/3 1/4
Loonzan, Kanungtoe (f.o.b. Rangoon) . .	...	7/9	7/6	7 1/1 1/2	7/3 1/2	—	—	—
No. 1 Saigon (f.o.b. Saigon) . . . . .	...	7/9	7/9	7/10 1/4	7/9 1/4	—	—	—
Siam Super (f.o.b. Bangkok) (*) . . . .	...	8/-	8/-	8/-	7/10 3/4	—	—	—
Tokyo "Tyumai", brown Japanese, average quality (yens per koku)	43.30	43.30	43.30	43.30	43.30	35 62	34.12	37.27 34.26
Linseed.								
Buenos Aires (a): Current quality, 4 % impurities (paper pesos p. quintal). .	*) 15.11	15.25	15.35	16.25	16.82	15.14	14.05	15.12 14.31
Bombay: Bold (rupees per cwt.) . . . .	...	...	...	...	...	7-5-7	6-14-9	7-12-7 7-4-10
London (c.i.f., shipping current or following month, £ per long ton):								
La Plata . . . . .	...	15-2-6	15-10-0	n. q.	*16-10-0	11-17-6	11-3-1	*12- 2-3 11-10-11
Bombay . . . . .	...	18-17-6	19- 7-6	20-0-0	19-16-6	13-6 -9	12-10-11	*14-10-3 13- 3- 9
Duluth: No. 1 Northern (futures; cents per 56 lb.) (*)	181	*) 181	*) 183	191	* 196 1/4	170 7/8	175 1/8	172 1/4 183 7/8
Minneapolis: No. 1 Northern (cta. p. 56 lb.).	185	185	185	195	193 1/4	178 1/4	179	180 190
Cottonseed.								
								1938-39 1937-38
Alexandria (a) (piastres per ardeb):								
Upper Egyptian	n. q.	n. q.	n. q.	n. q.	* 62.6	51.6	53.2	57.7 55.3
Sakellaris	n. q.	n. q.	n. q.	n. q.	* 61.1	50.2	48.6	54.3 50.7
London: Egyptian (c.i.f., shipping current or following month; £ per long ton) . . . . .	...	n. 8-2-6	8-7-6	8-7-6	8-5-10 1	5-10-9	5-15-4	6-3-5 6-1-6

* Indicates that the product was not quoted during part of the period under review. — n. q. = not quoted. — n. = nominal. — (a) Thursday prices.

(*) Maize: May-April: cottonseed: September-August. — (†) London Standard. — (‡) Quotations refer to May futures from January to May, to July futures in June and July, to September futures in August and September, and to December futures during the other months. — (¶) June futures. — (¶) Shipping July-August. — (¶) July futures — (¶) Average Nov. 1939 April 1940.

DESCRIPTION	June	May	May	May	Average				Commercial Season (¹)	
	7	31	24	17	May	June	June			
	1940	1940	1940	1940	1940	1939	1938			
								1938-39	1937-38	
Cotton.										
New Orleans: Middling (cents p. lb.)	n. 10.01	n. 10.10	n. 9.31	n. 9.98	n. 9.44	8.46	8.75	8.87		
New York: Middling (cents per lb.)	n. 10.36	n. 10.21	n. 10.37	n. 9.72	n. 10.30	n. 9.86	8.37	9.00	8.75	
Bombay (rupees p. 784 lb.):										
Broach, f.g. (futures) (¹)	¹) 191-8	¹) 200-0	¹) 220-8	¹) 222-14	167-12	145-14	156-2	166-11		
Broach, f.g. (spot) . . . . .	...	...	...	...	170-3	145-0	156-6	162-9		
Oomra, fine (spot) . . . . .	...	...	...	...	160-10	132-4	148-12	148-13		
Alexandria (a) (talaris per kantar):										
Sakellariadis, f.g.f.	n. q.	n. q.	n. q.	n. q.	* 19.85	11.42	11.94	12.37	14.19	
Giza 7, f.g.f.	n. q.	n. q.	n. q.	n. q.	* 17.62	11.45	11.65	12.34	12.81	
Ashmuni, f.g.f.	n. q.	n. q.	n. q.	n. q.	* 17.57	9.70	9.52	10.16	10.62	
Liverpool (pence per lb.)										
Middling, super good	n. 8.02	n. 8.02	n. 8.02	n. 8.32	6.36	5.38	5.88	5.79		
Middling	7.42	7.42	7.42	7.72	5.66	4.62	5.17	4.97		
São Paulo, g.f.	n. 7.67	n. 7.67	n. 7.67	n. 7.97	5.45	4.73	5.14	5.16		
Broach, good staple, f.g. (¹)	n. 6.39	n. 6.39	n. 6.39	n. 6.67	n. 4.17	n. 3.63	* n. 3.92	n. 4.04		
C.P. Oomra, good staple, superfine (¹)	6.54	6.54	6.54	6.76	4.41	3.85	* 4.11	4.29		
Giza 7, f.g.f.	10.18	10.18	10.18	10.44	6.67	6.84	7.22	7.42		
Upper Egyptian, f.g.f.	10.14	10.14	10.14	10.40	5.88	5.62	6.00	6.31		
Butter.										
								1939	1938	
Kopenhagen (a): Danish, for export (crowns per quintal)	n. 264.00	n. 264.00	n. 264.00	n. 264.00	n. 264.00	216.20	218.40	239.00	230.49	
Leeuwarden, Commission for butter quotations (a): Dutch, for export (cents per kg.) (¹) . . . . .	...	...	...	...	...	75 ½	80 ½	77 ½	80 ½	
Antwerpen, auction: Belgian (frs p. kg.) . . . . .	...	...	...	...	...	19.00	19.95	20.70	23.50	
New York (b) 92 score, creamery (cents per lb.) . . . . .	...	...	...	...	...	24 ½	26	26 ½	28	
Cheese.										
Roma: Roman Pecorino, choice (lire per quintal)	1,210.00	1,210.00	1,210.00	1,210.00	1,210.00	1,100.00	1,050.00	1,110.25	1,058.30	
Alkmaar: Edam 40+, National Mark, factory cheese, small (florins p. 50 kg.) . . . . .	...	...	...	...	...	17.10	19.56	19.35	21.33	
Gouda: Gouda 45+, National Mark, farm made, 1st quality (florins p. 50 kg.) . . . . .	...	...	...	...	...	24.05	24.69	26.52	25.72	
Eggs.										
Antwerpen, auction: Belgian, average quality (frs. per 100) . . . . .	...	...	...	...	...	49.20	53.00	56.00	58.80	
Denmark (c): Danish for export (crs. per quintal)	104.00	104.00	104.00	104.00	101.75	81.50	103.00	112.53	116.70	
Netherlands: Dutch, 55/60 g each, for export to Germany (florins per 100)	3.50	3.50	3.50	3.50	3.50	2.55	3.12	3.23	4.09	

* Indicates that the product was not quoted during part of the period under review. — n. q. = not quoted. — n. = nominal. — (a) Thursday prices. — (b) Wednesday prices. — (c) Average prices for weeks commencing on Thursdays.

(¹) August-July. — (²) Quotations refer to April-May futures during the period September-May following, and to July-August futures during the other months. — (³) As from March 15, 1939: "fair staple". — (⁴) For home prices these quotations must be increased by a consumption tax which, as from Oct. 19, 1939, amounts to 80 cents per kg. — (⁵) July-August futures.

AVERAGE MONTHLY PRICES BY COUNTRIES

GROUPS	DESCRIPTION	AVERAGE							Agricultural year (1)	
		March	Feb.	Jan.	Oct.	Jan.	Jan.	1938-39	1937-38	
		1940	1940	1940	Dec. 1939	March 1939	March 1938			
FRANCE (Prices in francs per quintal)										
A I	†Wheat (Paris)	208.00	206.50	205.00	202.00	207.50	187.00	205.35	183.90	
	Rye (Paris) (1-2)	151.00	156.00	154.00	115.00	127.00	139.65	125.50	142.80	
	Barley, malting (Paris) (1-2)	123.00	130.00	134.00	112.35	122.15	122.75	123.70	171.05	
	†Oats (Paris) (2)	96.00	97.00	97.00	79.65	101.55	123.60	101.00	127.30	
	†Wine, red, 10° (Montpellier) per hectolitre	200.00 *)	190.00 *)	185.00	165.00	164.35	152.65	164.00	155.00	
A II	†Beef, dead weight, 1st quality (Paris)	1,537.00	1,664.00	1,564.00	1,221.65	993.00	1,116.65	1,010.00	1,042.00	
	†Mutton, dead weight, 1st quality (Paris)	2,092.00	2,106.00	2,111.00	1,838.65	1,966.00	1,781.00	1,864.00	1,656.00	
	†Pigs, live weight (Paris)	1,182.00	1,112.00	1,036.00	851.35	905.00	813.35	935.00	784.00	
	Butter (Paris)	2,670.00	2,695.00	2,930.00	2,158.00	3,072.00	2,441.35	2,532.00	2,211.00	
	"Comté", cheese (Paris)	1,950.00 *	1,950.00	1,950.00	1,545.35	1,437.00	1,341.35	1,397.00	1,262.00	
	Eggs (Paris) per 100	73.80	n. q.	108.25	97.90	73.25	73.75	72.70	71.80	
B I	†Basic slag, 18 % (Thionville) (1)	1.35	1.35	1.35	1.35	1.13	1.08	1.16	1.05	
	†Superphosphate, 14 % (North and East)	52.00	52.00	52.00	46.50	41.00	43.90	42.45	40.75	
	†Sylvinit, rich, 18 % (Upper-Alsace)	14.32	14.32	14.32	14.10	14.32	14.32	13.92	13.92	
	†Nitrate of soda, 15.5 % (Dunkerque, Calais)	156.70	149.70	148.20	144.90	136.35	116.75	134.20 *	116.05	
	†Sulphate of ammonia, 20.4 %	145.95	138.95	137.45	134.05	131.55	115.10	129.81 *	111.90	
B II	†Linseed cake (North)	172.50	170.00	167.50	157.15	163.00	136.65	157.40 *	134.55	
	Coconut cake (Coudkerque)	n. q.	n. q.	n. q.	120.65	135.00	125.00 *	133.00 *	125.00	
	†Groundnut cake (Coudkerque)	135.00	n. q.	135.00	131.65	127.65	120.50	131.65 *	120.55	

GREAT BRITAIN (Prices in shillings and pence: "A" per cwt; "B" per long ton).

A I	Wheat	7/2	7/3	7 1/4	6 7/8	4/3 1/4	8/1	5/0 3/4	8/6 1/4
	Barley, feeding	16/8 1/2	17 1/4	17 8/8	13/6 1/2	7/6 3/4	12/7 1/2	8/2	11/9 3/4
	Oats	12/10	14/2	15 4	9/6	6/2	8/5 1/2	6/6 1/2	8 6 1/4
	†Potatoes (London) (1)	5/4 1/2	5/10 1/2	5/10 1/2	5/10 1/2	5/8 1/2	6/6	5/6 3/4 *	7/1 1/4
A II	†Beef, dead weight (London) . . . . .	...	...	...	74/8	66/1	73/9	69/5	72/7
	†Mutton, dead weight (London) . . . . .	...	...	...	92/2	72/-	72/6	70/3	76 8
	†Pork, dead weight (London) . . . . .	...	...	...	78 8	83/8	81/9	80/9	80/9
	Butter (London)	152/-	152/-	152/-	152/-	138 8	132/5	134/2	137/-
	Cheese, Cheddar (London)	88/-	88/-	88/-	88/-	91/-	97/-	90/4	94/9
	†Eggs, National Mark, (London) per 100 . . . . .	...	...	...	21/-	12/4	12/8 1/4	14/7 1/4	14/10 1/4
B I	†Basic slag, 14 % (London) (1)	59/3	59/3	57/-	55/6	46/-	46/-	46/-	45/3
	†Superphosphate, 16 % (London)	84/-	78/-	76/6	69/-	59/-	61/-	59/6	60/9
	Kainite, 14 % (London) (1)	180/-	180/-	180/-	186/9	55/-	55/-	55/-	55/-
	†Nitrate of soda, 15 1/2 % (London)	190/-	190/-	190/-	167/6	160/-	160/-	160/-	159/4
	†Sulphate of ammonia, 20.6 % (London)	186/-	183/-	180/-	153/9	152/4	152/4	150/4	149/7
B II	Bran, British (London)	165/-	165/-	155/7	127/6	120/10	157/6	119/4	150/7
	Bran, middlings, imported (London)	142/6	142/6	138/1	125/-	105/2	155/9	113/8	150/11
	†Linseed cake, English (London)	217/6	217/6	210/6	190/-	198/6	213/10	197/1	208/3
	†Cottonseed cake (London)	132/6	132/6	128/1	115/-	121/6	108/9	117/11	111/10
	†Palm-kernel cake (Liverpool)	155/-	155/-	150/-	135/-	143/8	149/7	145/3	148/4
	†Coconut cake (Liverpool)	172/6	172/6	166/10	150/-	149/9	155/10	149/3	154/1
	†Groundnut cake (London)	180/-	180/-	173/9	155/-	145/5	147/-	143/10	152/-

*Indicates that the product was not quoted during part of the period under review.

†Indicates that the series is published in the *International Yearbook of Agricultural Statistics*.

(1) July to June. — (2) Up to Aug. 1939 (for barley: up to March 1938) quotations on last day of month. — (3) As from the end of Oct. 1939: prices in the free market, f.o.r. producing points. — (4) Prices, per kg. of active fertilizer contained in 100 kg. of commercial fertilizer. — (5) As from Oct. 1939: maximum official prices. — (6) As from Nov. 1939: 18 3/4 %. — (7) As from Nov. 1939: muriate of potash, f.o.r. Widnes. — (8) Price paid by the military authorities: March: 165.50; February: 164.50, Jan.: 163.50; Oct.-Dec. 1939: 160.00. — (9) Average of the maximum official prices for Oct.-Nov. 1939.

		AVERAGE							Agricultural year	
GROUPS	DESCRIPTION	March	Feb.	Jan.	Oct.	Jan.-	Jan.-	1938-39	1937-38	
		1940	1940	1940	Dec. 1939	March 1939	March 1938			
NETHERLANDS (Prices in florins per quintal)										
A I	Wheat (1)	12.15	12.00	11.85	11.55	10.00	9.96	10.05	9.98	
	Rye (Groningen) (2)	9.00	9.00	9.00	9.00	7.73	7.10	7.68	7.12	
	Barley (Groningen) (2)	9.00	9.00	9.00	9.00	8.30	6.77	7.66	7.03	
	Oats (Groningen) (2)	8.00	8.00	8.00	8.00	6.34	5.56	6.45	6.17	
	Peas (Rotterdam) (2)	n. q.	n. q.	n. q.	10.55	11.35	14.36	11.81	14.69	
	Flax, fibre (Rotterdam)	n. q.	n. q.	n. q.	100.33	75.33	69.00	71.04	68.73	
	†Potatoes (Amsterdam)	4.25	5.72	5.13	3.96	4.70	4.90	4.16	5.14	
	†Beef, dead weight (Rotterdam)	83.00	81.00	81.00	76.67	71.33	76.83	72.87	76.29	
	†Pigs, live weight (Rotterdam)	62.00	61.00	65.00	64.00	47.33	58.00	49.50	57.29	
	†Butter for export (Leeuwarden)	80.50	82.00	81.75	80.00	83.33	80.67	77.87	84.50	
A II	†Cheese, Edam 40 + (Alkmaar)	44.50	47.62	45.50	44.84	38.77	43.75	40.06	42.23	
	Cheese, Gouda 45 + (Gouda)	60.00	63.00	63.50	65.05	51.37	52.88	50.26	53.60	
	†Eggs, for export (Roermond) per 100	4.77	5.02	4.14	4.59	3.59	3.35	3.76	3.62	
	B I	Basic slag, 16 % (Zwolle)	2.29	2.35	2.29	2.46	2.28	1.89	2.19	1.77
		Superphosphate, 14 % (Zwolle)	2.30	2.30	2.25	2.16	1.67	1.91	1.66	1.92
Kainite, 14 % (Zwolle)		1.70	1.70	1.69	1.65	1.68	1.65	1.63	1.63	
Nitrate of soda, 15 1/2 % (Zwolle)		7.00	6.95	6.69	6.27	6.36	6.38	6.32	6.33	
Sulphate of ammonia, 20 % (Zwolle)		5.81	5.65	5.55	5.30	5.46	5.44	5.47	5.38	
B II	†Maize (Rotterdam)	8.27	8.32	8.35	8.31	8.24	7.63	8.00	7.39	
	†Lined cake, Dutch (Rotterdam)	n. q.	8.75	8.75	n. q.	8.35	9.01	8.65	8.91	
	†Coconut cake, (Rotterdam)	n. q.	8.00	8.00	n. q.	7.81	8.27	7.90	8.31	
	†Groundnut cake, (Rotterdam)	n. q.	n. q.	n. q.	8.40	7.92	7.76	7.91	7.87	
	Crushed soya extraction residue (Zwijndrecht)	8.00	8.00	8.00	8.00	7.90	7.82	7.81	7.94	

* †: See notes on preceding page.

(1) Fixed prices, f.o.r. producing points — (2) As from September 1939: fixed prices, f.o.r. producing points

STOCKS

Rye and barley in farmers' hands in the United States on 1 June.

PRODUCTS	Percentage of total production 1)				Stocks in 1 000 centals			
	1940	1939	1938	1937	1940	1939	1938	1937
Rye	28.7	28.5	17.6	17.7	6,310	8,855	4,871	2,509
Barley	18.1	20.7	14.3	14.4	24,062	25,100	15,113	10,228

1) The percentages are of the previous year's crop.

Prof. UGO PAPI, *Segretario generale dell'Istituto, Direttore responsabile.*

AGRICULTURAL SCIENCE AND PRACTICE

MONTHLY BULLETIN

OF

AGRICULTURAL SCIENCE AND PRACTICE

A SURVEY OF FILMS ON AGRICULTURAL SUBJECTS

General considerations.

The progress made by the cinema during the past 30 years has made it possible to enlarge the field of action to a considerable extent. Originally a simple means of recreation, the cinema is now of great value in every branch of human activity, whether technical and scientific or social and economic.

The production of agricultural films was attempted long ago. The first initiative in Italy dates back to 1906, no further attempt being made however until 1915. A similar experiment was made in the United States in 1911, but it was not until after the world war that it became possible to put into effect plans made much earlier. Nowadays, the use of educational films with agricultural subjects is very widespread and it is even true that of all the types of educational films, those of an agricultural character are the most extensively exhibited.

It is easy to understand why agricultural pictures arouse so much interest. The picturesque and artistic interest of films dealing with important agricultural subjects of a general nature, such as the wine harvest, haymaking or the wheat crop, makes them certain favourites with the public, quite apart from their documentary value.

Even the most technical subjects are interesting to the general public. Some of these films may not be entirely comprehensible to the uninitiated, but there are very few which fail to arouse some curiosity. A picture entitled "Sugar Cane in Egypt", for instance, showing stripping of the stems and preparation of the shoots, preparation of the ground and planting of shoots, irrigation and hoeing, harvesting, cleaning and loading, unloading and storing in the the factory, manufacture of sugar, etc., would probably be favourably received by the most varied audiences. The least curious of spectators would be attracted by watching the manufacturing process of a product in such common use, while the better instructed spectator would be all the more interested in following a process with which he is already familiar in theory. Obviously, a film dealing with superphosphates of lime would attract a much smaller public, but, as it touches problems of paramount importance to the agricultural economy of the world, it would nevertheless arouse the interest even of spectators who are not specialized in agricultural subjects.

Lastly, one of the great advantages of films on farming subjects is that they render agricultural instruction independent of the seasons. This is of considerable value to institutions giving training in farm work. Pupils used to start their studies with a series of theoretical courses and practical demonstrations could not be given until later, either by means of periods spent on farms or else during the appropriate season in the case of schools situated in the country. The cinema has completely altered this situation and also makes it possible to use certain film devices such as slow motion, accelerated motion and enlargement which are invaluable as means of emphasis. Films cannot, of course, replace practical instruction, but the faculty of observation will be more easily awakened in the farm apprentice by natural phenomena if he has already followed their development on the screen.

This argument also holds good in the case of films shown to the inhabitants of rural districts, as during the winter months the farmer has more time to increase his knowledge of farming matters.

Objectives.

When used for instructional purposes, the rural cinema should consist of two quite separate types of films—

- (a) educational films proper;
- (b) films for propaganda on farming subjects.

In the former case, facts which have to be understood and assimilated must be clearly demonstrated and presented. In the latter, an attempt is made to draw attention to a subject which has to be emphasized or to enlist the sympathies of the spectator in a certain cause. Above all, care must be taken to present the subject in a pleasing manner if the film is to be rendered attractive.

Educational Films.

Two large sub-divisions must be made in this type of film according to the use to which they will be put:—

- (1) elementary educational films;
- (2) scientific or technical educational films.

The main purpose of elementary educational films is to give some fundamental notions concerning farming life in general and to bring rural problems as a whole before the public.

Educational films of a more definite character are necessary for pupils in agricultural schools who have already passed the elementary stage of instruction and for farmers anxious to improve their methods.

In the former case, the films should be as simple, clear and comprehensible as possible. In the latter case, on the other hand, they should present the technical and scientific aspects of some particular farming activity. In some cases two different films could be made on the same subject, one for elementary and the other for more advanced instruction.

Propaganda.

In the case of the propaganda film the object is not only to instruct but also to convince, to persuade and to stimulate. Propaganda of this description may be viewed from various standpoints. It may be addressed to the public in general or to the worker in particular.

When intended for the public, the aim should be to give an idea of life in the country, of farm work in progress, of the daily task in the fields and to put all this before the spectator in such a way that he comes to understand and appreciate it.

When appealing to the countryman, on the other hand, it would perhaps be well to show them the nobility of their calling, for too many of the rural inhabitants are tempted by the call of the town and factory. But the chief aim is to draw the farmer's attention to the many improvements he can make in his work. All too often, indeed, he has had no practical training in farming on rational lines. Generally speaking, farmers hand down their knowledge from one generation to the other without any real training and they cling to old-fashioned methods. Films shown in the villages and demonstrating new processes and the latest farming methods encourage an increase in production which may have excellent results in general. In the case of vine-growing, for instance, the diffusion of knowledge of the methods of combating disease has saved the vineyards. The projection of films is the easiest way to give the farmer some scientific knowledge on cultivation, harvesting, storing and preserving the products of the soil, and on the control insect pests and animals injurious to the crops. Then again, the cinema can teach him how to increase the fertility of his land through the use of different kinds of manure, or how to make the best use of the latest types of implements and agricultural machinery.

Turning to the matter of national or international propaganda, there is no doubt that here, too, films on agricultural subjects can be of great service. The film then becomes an instrument for promoting understanding and the exchange of information between different regions of the same or different countries. A farmer can learn much from studying and comparing the systems practised in countries other than his own; even if these systems are not applicable to his own district, he can nevertheless always obtain some useful information.

In certain countries an attempt is being made to use the rural cinema for commercial advertising, but this only a secondary aspect of the subject.

Production of films.

For teaching and publicity on agricultural matters, the cinema is undoubtedly a magnificent interpreter of nature and science. But the very variety and wealth of its resources make it an instrument which must be carefully handled. If ill directed, the results may be serious. While other uses are possible the main objective is the technical, vocational and social instruction of farmers. Now, a rural audience is not always easy to please. The peasant leads a simple life; his habits and language are simple too, but he also possesses sound good

sense and a well-developed critical instinct. A false note, an inaccuracy, would endanger the success of even the best films. On the other hand, although he is anxious to learn, he is also firmly bound by tradition and, being naturally suspicious, only a clear, exact and utilitarian demonstration has any chance of convincing him. Too much stress cannot be laid on the importance devoting the greatest care to the production of films on agricultural subjects. This work should be entrusted to experts, for satisfactory results can only be obtained through the collaboration of farming experts, film technicians and teachers. Only close co-operation between these three classes of specialist will lead to the production of good agricultural films which are at the same time educative and instructive pictures.

Should these be silent or sound films?

Up to the present, silent films appear to have been preferred as country halls were rarely equipped for the projection of sound films; now, however, that many small centres have installed suitable apparatus, the situation is different. A talking picture is much more alive. In the case of purely educational films for use in schools or for vocational instruction, talking films are perhaps not indispensable, the professor or lecturer being generally present to give the necessary explanations. The talking picture is, however, much more suitable for propaganda films. The spoken commentary is undoubtedly much more instructive and better appreciated by the public than sub-titles, however exact they may be. Moreover, a talking film can be used equally well without the sound apparatus and the commentary can always be supplied by a lecture given before, after or during the projection. It is thus likely that talking films will soon become general.

It would also be of great advantage to have rural films produced in natural colours. They would be invaluable, especially for subjects dealing with vegetable pathology and agricultural entomology. Unfortunately, the problems involved have not yet been completely solved and the production of colour films is extremely expensive! Considerable progress in this type of production has been made during the past few years and it may now be hoped that a satisfactory solution will soon be found.

Much controversy has arisen in connection with the size to be adopted for rural films. Some prefer the reduced 16 mm. film as it is less expensive, while others wish to maintain the ordinary 35 mm. size. There are many arguments for and against both solutions, but no decision has as yet been reached. Several countries have solved the difficulty by adopting both sizes for the majority of their films.

Distribution of films.

There are three ways in which films can be shown in country districts; by using permanent halls, travelling cinemas or portable apparatus.

The motor cinemas which did so much valuable service at the outset now appear to be on the decline. Gradually each little village with any self-respect insists on having its own cinema. There are now several types of portable appar-

atus on the market packed in a fairly small case; these machines can be mounted on a tripod like an ordinary camera and used in the most primitive village hall.

It is obvious that the long idle winter evenings should be selected for exhibitions, and care should be given to the choice of films. There is so much variety in the different types of farming that the programme must be adapted to the district where it is to be presented. Farming conditions vary from district to district and methods practised in mountainous regions are of necessity quite different from those in use in the plains. It may be interesting for the farmer to make comparisons, but there is always the risk of encouraging unsuccessful experiment, by suggesting methods which are unsuited to the area where he lives.

Present situation.

From a general survey of present conditions throughout the world it is clear that serious efforts have been made to encourage the organization of an educational rural cinema. There is, however, a striking lack of unity and co-ordination in the work accomplished and an absence of well-defined plans. However praiseworthy the efforts made so far, they are isolated and the results obtained do not justify the trouble taken. As regards important questions of a general nature, such as the control of pests and animals injurious to crops, the treatment of plant and animal diseases, and the great land reclamation schemes, international exchange of films is very desirable. Nothing has so far been done in this direction and no organization created to meet the need. About ten years ago the International Institute of Agriculture started a scheme of this kind, but gave up the attempt when the *International Institute for Educational Films* was created, as it seemed that this task would naturally devolve upon the latter institute.

The *International Institute for Educational Films* did indeed consider the problem and attempted to lay the foundations of a systematic plan for producing agricultural films in the different countries. It also attempted to negotiate an international convention for the adoption of a single standard size of film but nothing of a positive nature was accomplished. When the Institute was dissolved in 1936 a proposal was under consideration for the creation of an international centre for the exchange of agricultural films.

The last General Assembly (1938) of the International Institute of Agriculture, impressed by the manner in which this extremely important question had again been abandoned, recommended the *Permanent Committee to study in detail the practical means of developing the exchange of films of agricultural interest between different countries and, in particular, to publish periodically a list of the films reported to them by the Member Governments.*

A circular letter was therefore sent to 52 countries requesting the following information:

- (a) titles of films of an agricultural character released since January 1, 1935;
- (b) date of publication;
- (c) name of producer (official or private);

(d) technical characteristics (length, width, whether sound films or silent with sub-titles and if so in which languages, also whether produced in colour or black and white);

(e) summaries of the subjects illustrated in the films.

Replies have been received from 27 countries. Four of these are negative and come from the following countries: Canada, Belgian Congo, Lithuania, the Grand Duchy of Luxemburg, Twentythree are in the affirmative and have been received from: Argentina, Australia, Belgium, Denmark, Egypt, Finland, France, Germany, Hungary, India, Italy, Japan, Mexico, Netherlands, Netherlands Indies, New Zealand, Norway, Portugal, Scotland, Switzerland, Tunisia, United States, Uruguay.

Some of the replies are very complete and are accompanied by detailed lists with all the required information, while others are shorter. The information received will be published and it is intended to send a further request to those countries who have not replied or who have sent incomplete information.

In view of the present situation it would undoubtedly be premature to think of establishing a centre for the exchange of films in the Institute itself, as was originally intended. Thanks to the lists and information in hand, however, it is hoped to facilitate the establishment of direct exchange between the different countries.

In order to make the best possible use of the material now in the possession of the Institute, a series of articles will be published concerning the activities of the countries which have been kind enough to send the Institute the necessary information.

It will doubtless be possible at a later date to establish a first list of agricultural films existing in the various countries.

S. GAUGAIN.

ITALY ⁽¹⁾

Historical.

Italy was one of the first countries to have the idea of making agricultural films. The first appeared in 1906 and dealt with wheat cultivation.

Nothing further was done at the time and it was not until 1915 that another attempt of this description was made through the Italian Federation of Agricultural Syndicates of Piacenza, which published another film dealing with wheat cultivation.

Interest in the question was kept up even during the world war when the film began to be considered as an instrument of propaganda and for the diffu-

(¹) The material for this article was obtained, for the most part, from a report which the Italian Ministry for Foreign Affairs kindly sent to the International Institute of Agriculture. The information therein contained has been supplemented with some notes supplied by the courtesy of the National "Luce" Institute.

sion of agricultural information. The films of this period tried to illustrate the advantages of the use of new farming methods and more up-to-date agricultural implements capable of speeding up work and improving farming economy by increasing the yield and thus stimulating production.

A body was formed in Rome in 1918 under the name of *Cineagraria* for the production of agricultural films and their distribution in the rural districts.

A year later, in 1919, this body became the *Istituto Cerere per la cinematografia e proiezioni agricole* (Cerere Institute for cinematography and agricultural films), and in 1922 it was converted into a corporation.

This was the first institute to undertake the production and systematic distribution of agricultural films with the collaboration of the Ministry of Agriculture.

It organized a free loan service for all agricultural organizations and at its own expense equipped 5 itinerant cinemas which gave a series of performances in the various regions of Italy under the supervision of the Ministry of Agriculture. These performances were always accompanied by lectures given by experts attached to the Itinerant Chairs of Agriculture.

This institute also arranged for the construction of a light, portable and easily handled projection apparatus for the use of the Itinerant Chairs, so that the lectures and courses organized under their auspices might be illustrated by films.

The *Unione Cinematografica Educativa*, L. U. C. E., was created in September, 1924, this institute becoming the «Istituto Nazionale L. U. C. E.» in October 1925.

The two institutes were amalgamated in 1926 and in March of that year the "Cerere Institute" became the agricultural section of the "Luce Institute" under the name of *Cinemateca Agricola Nazionale*.

Present organization of the rural cinema.

The greater part of propaganda work done through agricultural films is organized by the "Istituto Nazionale Luce", which is the legal and technical organ entrusted with all matters concerning the cinema to which all other State controlled administrations must apply for the production and distribution of films. The pictures produced by this Institute are the best both from the technical point of view and for the purpose of international exchange.

The *Cinemateca Agricola Nazionale* executes its yearly programme with the approval and financial aid of the Ministry of Agriculture. It also keeps in permanent touch with the General Direction of Agriculture, the Standing Wheat Committee, the National Technical Agricultural Federation and the National Confederation of Agriculturists.

The *Cinemateca* has the following duties.

- (1) preparation of agricultural films for educational purposes and for technical and vocational training in agricultural subjects as well as for foreign propaganda concerning Italian progress in farming,
- (2) distribution of films in country districts through the technical and syndical organisations,
- (3) organization of the travelling cinema service;

(4) distribution of films to the agricultural and rural schools and for vocational courses for peasants given by the Itinerant Chairs;

(5) organization of lectures and distribution of printed leaflets dealing with subjects illustrated in the films shown and containing advice and regulations for cultivation on rational lines;

(6) organization of all cinema activities connected with agricultural organization and technique.

The national "Luce" Institute now has 80 silent and talking agricultural films. All these are 35 mm. films, as all the projectors possessed by the agricultural schools and organizations are made for 35 mm. films. There is a growing preference however, for 16 mm. films since they are more economical and easier to handle. It will therefore be necessary to print all the 35 mm. films in the smaller size as well in order to have a copy of each size. For this purpose the Luce Institute has made an apparatus which, working eight hours per day, can convert more than 7,500,000 metres of film per year.

In 1939 this Institute formed an additional section known as the *Cinemateca didattica* which is to produce an average of 80 films per year. These films are to be shown in all kinds of schools from primary to university. In 1940 films are to be made for rural schools. All will be 16 mm. films. In order to supply schools with 16 mm. projectors, a national competition has been organized in which foreign firms with factories in Italy have taken part.

The distribution of films is largely provided for by the "Luce" Institute. It possesses five travelling cinemas with sound apparatus which tour the country every year. The itineraries are first submitted to the Ministry of Agriculture and to the Provincial Inspectors and an annual grant of 385,000 lire is made. These cinemas travel more than 20,000 km. each year. The *Confederazione Nazionale Fascista dei Lavoratori Agricoli* has recently acquired three travelling cinemas with sound apparatus and also organizes showings of films. In addition, the "Luce" Institute has two travelling cinemas in Italian East Africa and one in Albania.

Annual film showings, including films lent to agricultural bodies for the illustration of courses and lectures, may be estimated at more than 3,000 with a public of about 4,000,000. It is hoped that, with the use of easily transportable projectors taking 16 mm. films, these figures will be greatly increased.

The following is a list of agricultural films produced by the L. U. C. E. during the past three years.

(a) and (b) The subjects of the following films were chosen mainly for purposes of propaganda among the rural classes; as satisfactory results have also been obtained by showing them in the agricultural schools, it appears unnecessary to separate these two categories:

Industrial silk worm rearing; pictures 161 m., text 119 m.

The silk campaign; pictures 916 m., text 403 m.

Hemp growing; pictures 348 m., text 146 m.

Maize growing; sound film, pictures 510 m.

Tomato growing, pictures 130 m., text 42 m.

Rice cultivation; pictures 633 m., text 180 m.

Tobacco growing; pictures 437 m., text 250 m.
 Saffron growing; pictures 248 m., text 140 m.
 Sugar beet cultivation; pictures 434 m., text 180 m.
 Cultivation of peaches; pictures 692 m., text, 350 m.
 Scientific manuring; pictures 1025 m., text, 520 m.
 Clearing land for crops; pictures 86 m., text, 85 m.
 The uses of electricity in agriculture; pictures 481 m., text 120 m.
 Intensive fruit cultivation; pictures 651 m., text 215 m.
 Wheat cultivation; sound film, pictures 593 m.
 Grafting; pictures 112 m., text 21 m.
 Sowing machine; pictures 50 m., text 6 m.
 Vegetable growing; sound film, pictures 1029 m., text 22 m.
 How bees swarm; pictures 110 m., text 490 m.
 Management of sloping land on hills and mountains; pictures 62 m.,
 text 42 m.
 Transplanting of wheat; pictures 95 m., text 36 m.
 Table grapes in Italy; pictures 562 m., text 228 m.
 The life of the bee; pictures 629 m., text 508 m.
 Vine-growing in Italy; pictures 674 m., text 254 m.
 Animal husbandry; sound film, pictures 926 m.
 To victory in the wheat battle; pictures 499 m., text 198 m.
 Oil extraction; pictures, 166 m., text 41 m.
 Wealth-producing woods; pictures, 1188 m., text 365 m.
 Italian forest industries; pictures 1291 m., text 236 m.
 From the swamps to the foundation of Littoria; pictures 380 m.,
 text 69 m.
 Land settlement; pictures 513 m., text 330 m.
 Farming in Toscana; pictures 364 m., text 335 m.
 The National Rabbit-Breeding Institute; pictures 416 m., text 22 m.
 From egg to hen; pictures 829 m., text 382 m.
 Flowers, fruit and insects; pictures 139 m., text 29 m.
 Harmless and poisonous medicinal plants; pictures 563 m., text 470 m.
 Land reclamation at Mussolinia; sound film, 1750 m.
 The olive and wild olive; sound film 605 m.
 Animal husbandry in Sardegna; sound film 1412 m.
 Soil management and wheat cultivation; m. 730.

In course of preparation:

Land reclamation in the Tavoliere region.
 The Sicilian "*latifundia*".
 Reclamation of the Volturno area.

(c) Flowers: dissemination and fecundation; pictures 382 m., text 159 m.

The life of plants; sound film, pictures 251 m., text 82 m.

(d) and (e) As many plant diseases are produced by animal parasites these two categories have been combined. The following subjects dealing with

insects injurious to crops also describe the various methods adopted in the campaign against insects and the treatment of plants attacked:—

The gardener's enemy; pictures 131 m., text 84 m.

The flour worm; pictures 133 m., text 53 m.

The field cricket, pictures 389 m., text 100 m.

The grasshopper; pictures 236 m., text 107 m.

The Orange scale *Icerya purchasi* and the *Novius cardinalis*; pictures 210 m., text 10 m.

The micro-life in hay; pictures 47 m., text 15 m.

Injurious insects; pictures 226 m., text 200 m.

The control of the scale insects of citrus; pictures 169 m., text 37 m.

The olive fly, pictures 210 m., text 120 m.

Replanting of vineyards affected by phylloxera, pictures 126 m., text 43 m.

The corn-moth, pictures 231 m., text 157 m.

Viticulture and phylloxera, pictures 681 m., text 400 m.

(f) Reclamation of the Pontine marshes; produced in 1937 by the Fascist Confederation of Agricultural Workers, pictures 1400 m.

(g) (None produced up to the present).

(h) (None produced up to the present).

(i) "Our Bread", sound film, pictures 322 m., text 16 m.

Land reclamation; sound film, pictures 411 m.

"Mother Earth", pictures 142 m., text 42 m.

"Back to the land"; pictures 872 m., text 660 m.

The beauties of the mountains and woods, pictures 650 m., text 334 m.

(l) Films for the prevention of agricultural accidents.

Accidents liable to take place in basement and underground cellars during the fermentation of must or the emptying of casks after tunning, pictures 142 m., text 126 m.

Accidents with sharp instruments and snake bites; pictures 58 m., text 116 m.

Accidents resulting from the use of implements and machines for ploughing and cutting fodder crops; pictures 170 m., text 124 m.

Accidents caused by carts; pictures 178 m., text 124 m.

Accidents caused by animals employed by the farmer in the course of his work; pictures 353 m., text 220 m.

Accidents caused by the use of portable ladders, pictures 168 m., text 140 m.

Accidents in the course of field work which may cause injury to the eyes; pictures 276 m., text 162 m.

Accidents which are liable to occur in the course of the upkeep of woods and the felling of trees; pictures 280 m., text 130 m.

(m) The National "Luce" Institute has also begun to produce agricultural films in the colonies and Albania. The two following films are now complete and have already been distributed:—

Fascist agriculture in the imperial territories; sound film, 460 m.

Forests and forest areas; sound film, 379 m.

THE GERMAN HORTICULTURAL EXHIBITION, STUTTGART, 1939

After the Dresden (1936) and Essen (1938) horticultural exhibitions, that held at Stuttgart from April to September 1939, was perhaps the most important event of this description which has ever taken place. Those who saw the magnificent spectacle of the Erfurt annuals under the glorious August sun, will never forget the sight as long as they live.

Each country has its own particular method of organizing flower shows. In England, for instance, there are exhibitions, such as the Chelsea Flower Show, where each exhibit, with its specialties and its rare specimens, is a market in itself, while cut flowers and potted plants adorn the huge pavilions, the rockeries and special gardens stretching out in long lines producing a fine effect; nevertheless, no attempts whatever is made to produce a general architectural effect. In Belgium the five-year exhibitions at Ghent provide a magnificent spectacle of massed azalea and orchids. The French flower shows are more or less the same. In Holland an attempt is made to create an architectural whole, the various branches of horticulture being arranged harmoniously. In other countries the flower shows are more or less on the lines of one or other of the above types of exhibition. In Germany stress has been laid during the past few years on the construction of an architectural whole and flower shows have been organized covering vast areas which are divided into several special exhibitions lasting the whole summer; they are then converted into permanent institutions for the towns where they have been organized with the collaboration of the Reichsnährstand (Food Corporation of the Reich).

This collaboration was particularly successful at Stuttgart, the large Württemberg town lying between the forest and the vineyards where, as the German Minister Darré justly remarked, German horticulture has always flourished. Situated on the slopes of the Killesberg, the site enjoys a magnificent view over the Swabian capital lying in the Neckar valley. The town has always been well-fitted to be a city of gardens, thanks to its position, climate and development and the site chosen for the Exhibition was suitable for creating something better than any which had gone before. Indeed, anyone who saw the Exhibition on a sunny day with its thousands of flowers, its green lawns and murmuring fountains, the whole framed in ancient trees with a background of hills and mountains, will never forget the sight.

The general plan and the artistic direction were entrusted to the landscape gardener Hermann MATTERN (Bornim-Potsdam) and to the architect Gerhard GRAUBNER (Stuttgart-Düsseldorf).

The plan has once more given prominence to the fact that of all branches of cultivation, only horticulture can bind the country to the town with close and strong bonds. It has pointed the way for passing from one to the other and, above all, has shown how the country may be said to have penetrated into the town.

A living picture of the Schwabian countryside, its inhabitants and their activities was produced over an area of 500,000 square metres. When it was planned five years ago, to illustrate the history of German horticulture on this site with its old deeply-hollowed quarries and its littered and rubbish-covered slopes, many people thought that it was unsuited for the purpose. A tremendous amount of work has been accomplished to make it possible for the horticulturists of all Germany to display their products: fruit trees, vines, vegetables, flowering annuals, perennial and graminaceous plants, bulbs and tubers, native and exotic plants.

The following figures give some idea of the volume of work accomplished: 26 months were required to shift 600,000 cubic metres of earth, lay out 150,000 square metres of roads, cover 20,000 square metres with flagstones, lay 20 kilometres of mains, hollow out 10 large pools with a total area of 15,000 square metres and construct 3.5 kilometres of narrow gauge railway. The general planning, clearing and cleaning of the site alone cost 882,000 Reichsmarks. The construction of a road system involved a further outlay of 461,000 Reichsmarks. The planting of trees and shrubs and laying of lawns cost 480,000 Reichsmarks, and the total expenditure for the exhibition as a whole came to some 7 million Reichsmarks.

With the assistance of caterpillar cranes, 800 large trees (some of which weighed as much as 100 quintals), were planted, as well as 20,000 shrubs, 50,000 rose trees, 120,000 flowering bulbs, 300,000 perennial plants, 500,000 plants flowering in spring and 300,000 flowering in summer. After the hard work of more than two years, not only was an uncultivated area transformed into cultivated land, but the end attained most probably surpassed all expectations. The special configuration of the site where neglected forests alternated with quarries until the workman came with his pick to disturb them, made it possible to produce effects which could not have been obtained elsewhere. In the evening magnificent floodlighting effects were produced by 500 lamps set in as many hollows playing from the ground upwards on trees and flowers.

On this extensive site landscaped as an architectural whole, several smaller exhibitions were also arranged, such as the open-air instructive exhibitions organised by the "Reichsnährstand" and including nursery gardens showing grafting on walnut trees and all root stocks for fruit trees, the instructive fruit-growing exhibition, the exhibit of flowering and ornamental plants with a huge greenhouse for carnations, different varieties of pelargoniums and geraniums in boxes, the vegetable exhibit and the model workshops.

Mention should also be made of the following exhibits: silkworm rearing, the garden showing comparisons of various perennial plants, the herb garden, the field with honey-producing plants and the model cemetery.

Various other exhibits were also planned: spring flowers, early vegetables and late fruits, perennials and cut flowers, the balcony flower competition, cacti and succulent plants, rose bushes, bouquets and wreaths, gladioli, novelties, dahlias, autumn flowering plants, fruits and vegetables. As far as I know the three last-mentioned exhibits did not take place. Personally I only visited the novelty and gladioli exhibits. The latter was the finest one could possibly see in any part of the world, as will really be understood when it is recalled that Stuttgart enjoys a world reputation for growing gladioli.

It is not within the scope of this article to describe every part of the Exhibition, but it should be stated that, in spite of the fact that the horticultural exhibits were very fine, they would not have produced such a good effect if the architecture of the buildings had not been beyond reproach. Even at the entrance one could clearly see that all the problems of urban building and their adaptation to the Stuttgart landscape had been very carefully considered. As Dr. STRÖMELICH the mayor, stated at the opening, the grounds were to be converted into a zoological garden at the close of the Exhibition and will serve for the recreation of the population, in execution of the plan to create open spaces. The Exhibition was therefore not merely constructed for a temporary purpose, but as a permanent institution whose ultimate appearance will have lasting importance in relation to the development of Stuttgart.

The architect GRAUBNER created a fine expression of the concept of space relations in the handsome group of entrance buildings surrounding the Court of Honour. The visitor entered through the forecourt, framed by the administration building, the entrance hall and a wing of the Industrial Art School. From there he obtained a view of the Court of Honour with its buildings. The court was simple and full of light, while the effect of the red sandstone buildings surrounding the flag-covered court was impressive.

Leaving the entrance hall, after passing beside the ticket booths and descending the stairway to the Court of Honour, the visitor was obliged to pass through the Reichsnährstand Hall of Honour. From here he went into the hall dedicated to the Reichsnährstand's exhibits, then into the Exhibition Hall and thence, passing in front of the pillared hall on the terrace, to the instructive pavilions organized by the Reichsnährstand, including one displaying tropical plants. The visitor then proceeded to the next group of buildings by way of wide stairways and terraces. Then came the restaurant. In this way the visitor proceeded from one scene to the other, each with its own buildings, most of which were in red keuper sandstone, extremely well-suited to the landscape, as was also the mottled Black Forest sandstone used for the stairways.

A particularly handsome architectural effect was afforded by the Reichsnährstand hall with its nine large arcades in massive stone measuring 14 metres in width and 9 metres in height. This effect was enhanced by the fact that looking out from the hall there was a fine perspective of the Hall of Honour, 12 metres in height, the visitor being greeted by the sight of a huge hand-cast heraldic eagle 6.5 metres by 6.5 metres, standing out against the end wall.

The Exhibition was a tremendous success. Stuttgart horticulture and that of Germany as a whole may well be proud of the achievement. I do not

Ceylon were brought on the market in such vast quantities that there could be no hope of an equilibrium between supply and demand for a long while. After the greater part of this bark was taken up by the market, the *C. ledgeriana* plantations in Java came into full production and thus the amount of quinine sulphate, that was offered for sale in the form of cinchona bark remained considerably greater than the demand, notwithstanding that Java was then the only source, the production in India being entirely devoted to local requirements. The effects of overproduction were felt for nearly twenty years. The price reached such a low level that many undertakings could hardly work at a profit and there was a danger that this cultivation would be abandoned in favour of a more profitable crop just as had already happened in Ceylon.

The first improvement came when the producers in the Netherlands East Indies came to an agreement with the manufacturers of quinine (1913), by which the supply and sale of cinchona bark was regulated according to the world consumption. One of the chief objects of this agreement was to make a profitable cinchona cultivation possible and to maintain it in the future; to achieve this end the available production was entirely regulated according to world consumption, the manufacturers accepting a quantity of bark annually which, expressed in kgs. of quinine sulphate, corresponded to the quantity sold in the same year. The quantity of bark to be accepted from the producers was in this way limited, a limitation which of course meant that the undertakings had to reduce their production.

This agreement brought an end to the excessive supply of cinchona bark and thereby eliminated the chief cause of the economically unfavourable situation in which the cultivation of cinchona had laboured so long, and the goal—to make cinchona cultivation profitable again and to keep it so in future—was reached successfully but overproduction was not really prevented. The equilibrium between the bark marketed and that used, achieved in this way, was only obtained by an artificial limitation of the harvest by the producers, who could only sell a fraction of the quantity of bark that they could produce by the normal working of their estates.

In fact, then, the potential overproduction of the Java cinchona estates has not only remained but has actually in a large measure increased. The quantity of bark now delivered from the Netherlands East Indies bears no relation to the normal yield of the cinchona estates, for really they are capable of producing much greater quantities of bark by normal working.

In Ceylon the first attempts to introduce cinchona cultivation date from about 1861. A start was made with the varieties of seed collected in South America by MARKHAM'S expedition which consisted of *C. succirubra* and *C. officinalis*; later, seeds of *C. ledgeriana* were also obtained (1881). At first the planters showed little interest in the new crop but when they recognized that their flourishing coffee plantations were doomed by the dreaded disease, *Hemelia vastatrix*, they changed over more and more to the cultivation of cinchona; they saw in this a way to overcome their difficulties, for the new crop enabled them to plant again where the coffee had been destroyed. Thus in a few years there were extensive cinchona estates in Ceylon as well.

Year	Area of cinchona estates in Ceylon
1873	1,500 acres
1879	20,000 "
1881	45,000 "
1883	64,000 "

As these extensive plantations came into production, the supply to the cinchona market increased rapidly and the proportion of this much too ample supply that could be absorbed grew still smaller and the unit price fell still lower. The situation became worse when the bark from *C. ledgeriana* grown in Java became known in the markets. The price of the bark from Ceylon, which was in general of poorer quality, fell to such an extent that the alternative was a rapid uprooting of the cinchona estates in order to plant tea which, at that time, offered much better prospects.

The following figures give a good idea of the rapid increase in production and the simultaneous fall in prices.

	Production in kgs from the cinchona estates in Ceylon *	Standard price in Dutch cents **
1878	84,619	69
1880	526,381	72
1882	2,109,142	63
1884	4,374,971	33
1886	6,345,307	21
1888	5,662,476	12
1890	3,976,950	7 8
1892	3,101,357	5 4
1894	1,145,755	3

* Ch. Bohringer, *Fropenpfl.*, (1909) 13, 296

** By "Standard price" is understood the price per 500 g bark per 1%, quinine sulphate content.

In short, Ceylon was able in a short time to become an important producer of quinine and, in an almost shorter time, when the effects of overproduction were felt, the cultivation died out; whereas in 1883 there were 64,000 acres planted with cinchona, ten years later there were only 5,000 acres so planted. These experiences with the cultivation of cinchona in Ceylon show how easily the cultivation of a medicinal plant can lead to overproduction and how disastrous the consequences can be.

In contrast with Ceylon, cinchona cultivation has remained in Java but only at the cost of a long period of adversity in which the characteristic persistence of the Dutch was severely tried. During this period it was a help to cultivation of cinchona in Java that it had been recognized from the beginning that the future of the industry was bound up with the cultivation of the *C. ledgeriana* with its high quality bark; in consequence, the low unit price was less disastrous for the producers in Java than in Ceylon where an inferior product was grown.

Even more than any other single factor, the exceptional suitability of the climate and soil in Java contributed to the success of the cultivation of *Cinchona ledgeriana* there.

From the numerous attempts to introduce cinchona cultivation into other countries, one thing is obvious: nowhere else have conditions hitherto been found that are so favourable that results similar to those obtained with *C. ledgeriana* in Java can be expected. PERROT was right when he gave his warning "I cannot insist too strongly that one should not be deluded by exaggerated hopes, the intensive cultivation of cinchona seems hardly possible in the French colonies which cannot supply, even after years of methodical trials, more than a part of their own needs." What PERROT says of the French colonies is also more or less true of the other tropical countries where trials have been made with the cultivation of cinchona.

In India the cultivation of cinchona was started immediately after the seed collected by MARKHAM in South America was brought there (1861).

In the first years most attention was paid to *C. officinalis* and *C. succirubra* but later *C. robusta*, in particular, was also cultivated. A short time after the *C. ledgeriana* seed was taken to Java, a large quantity of seed from the same source was received in India, from this seed 60,000 plants were grown. The young *C. ledgeriana* plants were planted out in experimental plots in Madras and Bengal. It would seem that the soil and climatic conditions at the experiment station in Madras were very badly suited to this species of cinchona which is, in both respects, very exacting and in 1880 there remained only about 50 plants that had survived from the imported seed, in Java, on the other hand, almost all the plants grown from the original seed were available.

Similarly in Bengal the first tests were made with *C. officinalis* and *C. succirubra*, the tests with *C. ledgeriana*, begun at the same time as those in Madras, were more successful here. The climate and soil of Bengal seemed more favourable to last-named species of cinchona and even now the Government's cinchona estate is predominantly planted with *C. ledgeriana*. Meanwhile, although Bengal seemed better suited than Madras to cinchona cultivation, years of experience had proved that neither place is comparable with the cinchona districts of the Dutch East Indies, since the yields of the plantations in Madras and Bengal remain far below those of the plantations of Java and Sumatra.

After the Great War the English made an attempt to increase the production of cinchona bark in India. A search was made for new land particularly well suited for the cultivation of *C. ledgeriana* and it was thought that certain districts in South India and South Burma, amongst others, would be suitable. The first place in Burma where trials were made was soon found to be unsatisfactory both as regards height and rainfall; other districts were then tried in the south of Tenasserim where the rainfall is less heavy and better distributed.

¹ Em. Perrot, *Quinine et Quinine*, 1925

² In the Government cinchona estate in Java there are still 200 of the *C. ledgeriana* trees which were grown from the original imported seed and which are thus 74 years old.

In the beginning the results obtained here were regarded as promising, the nurseries were successful and the development of the plants in the open ground was very satisfactory (Report Bot. Survey of India 1923-24 and 1924-25). It was already expected that a prosperous cinchona-growing district would develop "extending from the Tenasserim river eastwards to the borders of Siam". The following reports have a less optimistic tone, the climate is not considered very suitable and the number of plants attacked by diseases and parasites is alarmingly great.

In the 1926-27 report it is said: "It has now been proved by experience that, however well suited for Cinchona a locality may appear to be, there may be unforeseen or unknown factors, that render it quite unsuitable for this fastidious plant". In the 1928-29 Report the results up to that time were summarized as follows: "But the most important information has already been obtained; it will grow cinchona and it may grow it at some profit under present conditions of world prices, but it will never be a first class area for the purpose".

Since that time the prospects of economically profitable production in South Burma have apparently not improved. When in 1937 the trial plantations—hitherto financed and administered by the Government of India—were handed over to the Burmese Government, the latter was not prepared to go any further with the trials, an indication that little or no profitable results were anticipated. All the plants were uprooted in the same year and the land was left.

Thus, this important experiment came to an end; it had been conducted with energy and ability and at considerable expense; it was given up for good after being carried on for 18 years "with untiring tenacity and doggedness which the Anglo-Saxons always apply to solving the problems of tropical agriculture which concern the development of their colonies *".

In South India also trials were begun in 1925. In the Anamalai Hills; there was, according to an estimate, about 10,000 acres of land suitable for the cultivation of cinchona. In 1931, 939 acres of this land had been planted with cinchona, there have been since that time no further plantings so that the original plan providing for a area of 2,300 acres was carried out only in part. This land was planted for the greater part with *C. ledgeriana* and from the very beginning there was trouble with a disease described in the reports as "die back". With reference to this disease the 1927-28 report says "the prevalence of disease makes the future not very reassuring, for the result is that large areas are lacking in an adequate supply of plants". Later reports indicate that most trouble was experienced with this disease at lower altitudes (2,000-3,000 ft.) (610-910 m.).

The plantations in the Anamalai Hills have been, up to now, worked normally and the figures giving the yields have been published regularly, (Cinchona Administration Reports). From these figures it seems that the yields obtained are not noticeably better than those obtained in the former Madras plantations. In considering the yields, it must be borne in mind that the trees in the Anamalai Hills have been planted on virgin forest soils.

* Aug. Chevalier, *Rev. Bot. Appl.*, 4, 393 (1924).

In general the published data concerning cinchona cultivation in India indicate that the average yield per hectare is hardly a quarter of the potential yield of the estates in the Netherlands East Indies; it is therefore not without good reason that private planters have abandoned cinchona cultivation as being unprofitable. The report of the Government Cinchona Department of Madras for 1930-31 stated that "though areas suitable for an extended growing of the cinchona tree undoubtedly exist, it is unfortunately the case that its cultivation is by no means readily profitable as can be gathered by the complete withdrawal of private enterprise from cinchona growing".

The importance of quinine as a medicine has time and again raised the question in the mind of the medical world whether the provision for world requirements is adequate and too often the answers given show a lack of information regarding the factors affecting the production, marketing and distribution of this commodity. There is a widespread belief that too little quinine is produced. It is thought that the production of quinine should be very considerably increased; quinine would then become cheaper, and, since the present price of quinine is considered the main obstacle to malaria control by its use, the lower prices would greatly increase consumption.

On the other hand, it must be at once pointed out that the facts indicate otherwise. The experience of the period of low prices which preceded the present agreement is particularly instructive in this respect. For years the cinchona planters produced more bark than the market had absorbed the previous year, nevertheless, although there was, for several years in succession, an excess supply of bark available at a low price, the world consumption of quinine did not appreciably increase during this time. Probably, the objection will be raised that the cheap bark was certainly available but that the manufacturers kept the price of quinine up and thus prevented an increase in consumption; the fact is however that the price of quinine during this period was often low for a long while.

A more recent experience teaches the same lesson. In 1933 the official price of quinine was lowered by 25 per cent. and since then maintained at this lower level; yet since 1933, consumption has not appreciably increased. If the consumption was really affected by too high prices then surely a lowering of 25 per cent. should have been followed by a clearly marked increase in consumption. The facts being as they are, previous experience is confirmed and it must be concluded that the relation between the price and consumption of quinine is not governed by the simple rule that low prices give a rapid turnover.

That the relation is in fact much more complicated will be made clear by the following. The use of quinine is limited in the first place by the fact that it is not an ordinary commodity for consumption but a powerful drug. Its exclusively medicinal application implies that there is only a limited market. The conditions are altogether different from those that could be brought about in the case of, say, tea or rubber by advertising, by which people can be persuaded to drink tea instead of other drinks or to use rubber in preference to other raw materials. The possibility of increasing the consumption of a medicine that has been known for centuries, at the expense of the consumption of others, is, practically speaking, non-existent.

As those who use a drug, in general require it only for its specific action, they will buy it, as and when they need it through the retail trade. In the pharmaceutical business retail prices are only very slightly affected by wholesale prices and therefore a lowering in the wholesale price of quinine will have little or no effect on the price of quinine tablets sold to the public. As a rule, therefore, a lowering in the price will not benefit the consumer who must obtain his quinine from a retailer. Even if the retail price were lowered the reduction would be of little importance to the buyer for quinine is a drug that is used in small amounts and further, in the case of a drug, the rule that a lower price increases the desire to buy can certainly not be considered valid.

Quinine, which reaches the consumer via the retail trade is thus not likely to be used in larger quantities as a result of lower prices. The quantity of quinine however, that is sold annually is not entirely handled by the retail trade, not inconsiderable amounts being purchased wholesale, in particular by Governments, for malaria control; these transaction almost always involve large quantities so that it may be expected that the price of quinine will exert some influence in this case, inasmuch as the inclination to change over to the use of quinine from other methods of control will be greater, or malaria control by means of quinine will be practised on a greater scale, according to the price of quinine. That such a connection exists is obvious but it will be shown later that the price of quinine is not the only factor involved in the improvement of malarial districts by the use of quinine, nor, as a rule, is it the most important.

At first sight it certainly seems that there is reason to fear that malaria control with quinine might be hampered by a too high price of this material. By the agreement between the growers and manufacturers the quinine market is almost entirely under the control of the manufacturers and experience teaches that such an arrangement very easily leads to a rise in prices. It is therefore explicable that, also in this case, the danger of the price being raised and thus the provision of quinine for the malarial districts being made more difficult, is considered by many to be more than illusory. Undoubtedly the agreement, if it had this effect, would earn general disapproval.

Such a result would be, above all, unacceptable to the Government of the Netherlands East Indies and entirely opposed to the position that it has always taken up, ever since the introduction of cinchona cultivation. To ensure the success of this industry the Government spared neither effort nor money but it had not taken this course for the hope of possible profit. Although the Government seemed always prepared to further production by profitable private enterprise, it was always with the view of ensuring a regular supply of this indispensable medicine, of which a great shortage was feared. The position was clearly outlined by ROCHUSSEN when he wrote (1862) "It is not as a financial speculation but from common humanity that the Netherlands Government has undertaken and is carrying out this work". If now the position that has arisen through the agreement between the growers and the manufacturers should prove a hindrance to malaria control with quinine, then the main object for which the Government was aiming would be entirely missed. True to the policy that it has always followed, the Government has also taken measures to ensure that there will be

no hindrance to malaria control. The Government undertakings * only take part in the cinchona agreement on the following conditions:

(1) that the parties taking part in the agreement bind themselves to collaborate in supplying quinine on special terms in districts that have a special need for it;

(2) that the Government of the Netherlands East Indies reserves the right to resign from membership of the Association if it is of the opinion that the Cinchona Agreement is a hindrance to the provision of quinine to malarial districts.

Further, a Government Commissioner has been appointed, whose work it is to ensure that these conditions are always maintained.

As the Government has provided itself with a guarantee that there shall be no hindrance to the supply of quinine to malarial districts, it is in the interest of the growers themselves to further this aim. The cinchona estates of the Netherlands East Indies still have a potential production, far in excess of the amount sold for years. If this potential increase in the yield could be used in whole in part for systematic malaria control with quinine, a real interest of the cinchona cultivators would be served; they would thus be freed from a strangling restriction which makes the cinchona business to a large extent an abnormal one.

Without a doubt, much larger quantities of quinine could be used in the control of malaria. In the case of India striking figures are available. According to data published by the Health Organization of the League of Nations ** the total number of malarial patients in this country is estimated at 100 millions, of these 8 to 10 millions receive treatment each year. The quantity of quinine that should be necessary for India alone is estimated at 1,200 million kilos whilst its total consumption is only a small proportion of this amount.

In other malarial countries as well, the consumption of quinine remains far below the amount that should be necessary were all malarial cases to receive regular curative treatment.

It will be asked how it is that such a need for quinine exists whilst the cinchona estates in the Dutch East Indies are capable and willing to produce much greater amounts of cinchona bark. Several relevant factors are mentioned below.

In the extensive malarial districts where there is a great need for quinine, the population is very impoverished and the individual purchasing power is so small that there is no possibility of the people providing themselves with a regular and adequate supply of quinine; the only solution here is that the necessary quantities of quinine are obtained and supplied gratis to the people by the State. Where the governments concerned have adopted this method in the past, the required quantity of quinine has in fact been supplied for the most part at

* The Government of the Netherlands East Indies, through its own estates, has the disposal of such a large proportion of the total production that the Cinchona agreement could not work without its collaboration.

** Enquiry into the Quinine Requirements of Malarial Countries and the World Prevalence of Malaria Geneva, 1932.

prices lower than the official price. In this way the manufacturers and growers are already endeavouring to increase the sale of quinine by moderating prices. It is, moreover, the work of the Government Commissioner to investigate whether the prices for these deliveries are kept in the right relation to the rule of the cinchona agreement quoted above, that treatment of malaria by quinine should not be hampered by a too high price for quinine.

The above moderation of the price of quinine and State supervision have a tendency to increase the supply of quinine to malarial countries. The suggestion, that many countries would adopt quinine treatment in malarial districts, were the high price of quinine not an obstacle, is thus difficult to maintain. The truth is that there are other factors which work against it and these have often a greater importance to the Governments concerned than the cost of supplying quinine.

First is the fact that in almost all countries the expenditure for defence absorbs a disproportionate and still growing proportion of their budgets. The immediate result of this is that there is a limitation of other expenditure, owing to which schemes for sanitary measures, among others, cannot be carried out; but even were the governments to have money enough available for the provision of the quinine required, the treatment of the malarial districts would still not be accomplished. There would still be the necessity of a well organized distribution under complete medical supervision, in which respect most of the countries concerned are almost always lacking. This organization would have to be built up from the beginning, which is in general impossible, for the necessary expert personal is not available, and, further, the founding and maintaining of such organizations involve very heavy expenditure, for that matter, considerably heavier than the cost of the necessary quinine. It is these expenses, those bound up with the founding and maintenance of a good organization, that are the real obstacles to the general treatment of the great malarial districts with quinine.

The enquiry made by the Health Organization of the League of Nations in 1931 led to the conclusion " that the world consumption of quinine is still far below the minimum necessary for the treatment of all malaria cases ". The conviction that much more quinine should be used for malaria control has led to further attempts in the last few decades to introduce cinchona cultivation into several other countries. None of these attempts has had the result of producing more or cheaper quinine or is likely to do so in the near future. Similarly, attempts to substitute quinine by related alkaloids or synthetic materials have also been unable to register any success, so that the importance of quinine as a trustworthy medicine for the control of malaria, especially on a large scale, has remained unshaken. Everywhere the desire to have more quinine for the control of malaria is noticeable and this desire will make itself felt still more when once defence expenditure can be brought back to more normal proportions and the governments are again able to devote more attention to sanitary measures in malarial districts.

It is to be expected that the question of the quinine supply will then again attract more notice. If it is really desired to bring this question nearer solution, then we consider that the first thing to be studied is the other important question: how to make the very great quantities of quinine that could be produced

on the existing plantations in the Netherlands East Indies, in excess of the present sales, available in future for the control of malaria.

There are a number of important factors that favour the control of malaria with quinine. In the Netherlands East Indies there are plantations that could immediately produce quantities of quinine much greater than the present world consumption. The Government of the Dutch East Indies has sufficient guarantees to prevent the position that has arisen as a result of the agreement between manufactures and growers from being misused in such a way that the supply of quinine to malarial districts is hampered. The cinchona estates in the Dutch East Indies would be glad to produce larger quantities, for in this way they would be able to work more normally. As a result of the agreement, all the growers and manufacturers are practically united and it is possible to make larger quantities of quinine available regularly for the control of malaria at special terms over a long period.

In addition to these favourable factors there are, of course, the circumstances, already indicated, which hinder and prevent the surplus from Java's cinchona plantations reaching the millions of malaria cases to whom it could bring relief and health. In the future, nothing must be left untried that could remove these obstacles and, if there should ever be international collaboration to distribute important products in a more equitable manner, then undoubtedly quinine, the pre-eminent remedy for one of the greatest curses of mankind, must be one of the first materials to be seriously considered.

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NEW TENDENCIES IN RURAL BUILDING

General.

In the last few decades rural building in general has lost much of its affinity with the surroundings. This is in many cases due to the unprofitability of the more traditional architecture, and efforts to attain the one end – greater profits – have also led to an entirely utilitarian style which is not adapted to the surroundings and of little aesthetic value.

However, technical development need not be hampered, as can be seen in the newest constructions which have, in many cases, the fundamentals of good design in relation to the surroundings and at the same time utilize all the technical and economic possibilities.

Though there is an ever growing need for new building in connection with rural settlement policies, the splitting up of villages with the transference of farm

buildings to the land worked, the formation of small units and, finally, the restoration of dilapidated buildings; the possibility of building unfortunately lags behind the growing need. It is for this reason that for several years attempts have been made to increase the volume and speed of rural building by developing new materials and new principles of construction. These attempts have resulted in progress and improvement but there have also been setbacks which have shown that methods of construction that have evolved from centuries of experience avoided many pitfalls that only become evident when new methods and materials are tried. Further, it has been found that many new materials, though they may have some remarkable properties, lack certain others, equally desirable.

According to W. TREIBEL, before a new building material is used it should be tested for the following properties: (1) compression resistance, fire and frost resistance and constancy of volume, (2) permeability to water, capacity to absorb it, formation of condensation droplets, (3) thermal conductivity under ordinary conditions of moisture and wind, and finally (4) acoustic properties and ability to hold nails. Such tests are nowadays usually carried out on walls and partly on finished buildings (this applies particularly to thermal and acoustic insulation). For a standard of comparison it is usual to take a brick wall 38 cms thick. As a rule, a new building material can only be adopted if, for an equal or lower price, the properties of the new material are equal to those of the standard brick wall. It may be pointed out that for agricultural purposes certain properties of such a wall are unnecessarily high whilst others could well be improved.

Recent trials of methods of construction.

Numerous trials have shown that the shape and size of building materials must be such that they can be conveniently put into position by hand. Constructional units that require special machinery for erection and transport have hitherto been found unsuitable in the country. The idea has been mooted that units of a wall could be manufactured industrially and these more or less large units assembled in position, with a saving of much time and labour, but up to the present this method has not established itself except for certain constructions made from simple wooden or metal units that can still be assembled by hand. Attempts to apply the same method to constructions in concrete by manufacturing large panels of light concrete industrially have hitherto failed completely because the panels so made cannot be handled, except by special machinery, on account of their weight. In the construction of small buildings, the use of such machinery is extremely costly and further it has been found in completed buildings made with panels of concrete that the outside walls frequently develop cracks.

Here, in short, is the reason why recently investigation of entirely new methods of construction have been more or less given up and more attention is being paid to the systematic improvement of methods of construction already known.

Building with Bricks.

This method of building has been developed by centuries of use and offers all imaginable guarantees as to its natural properties and methods of working. For reasons connected with thermal conductivity, solid brick walls have, in general, a thickness that, from a mechanical point of view, cannot be entirely justified except to support the heavily loaded members of more or less big buildings. It is for this reason that in smaller buildings, or in parts of a building that are not heavily loaded, cavity walls, and hollow or perforated bricks have recently been used; such constructions, in spite of a less thick wall and an economy of material, still have sufficient solidity and, owing to the interstices filled with air, satisfactory thermal properties. Nevertheless, in cavity walls formed by two walls with intercommunicating spaces between them, it has been found that condensation water forms easily on the inside and makes the walls damp and that this water is liable to freeze in cold weather; consequently this type of construction has been abandoned.

In order to obtain good thermal insulation it is necessary, as far as possible, to ensure that the cavities in the wall are not communicating, this condition has been realized recently by the use of hollow bricks which are now used in all manner of forms in all types of buildings.

However, hollow bricks with longitudinal cavities have also certain disadvantages, it is difficult to drive in nails and in warm climates they harbour vermin after slight damage has made openings into the cavities. For this reason it seems more advantageous from several points of view to use bricks that, instead of longitudinal cavities, have a large number of vertical perforations.

Recently, attempts have been made to manufacture porous bricks with a large number of small non-communicating pores. There are, in fact, fat clays that with the addition of substances that burn without a flame (coal dust, tan, lignite, sandust, peat etc.), may be made into bricks which after firing weigh half as much as ordinary bricks made with the same clay and which, being more porous, have thermal insulating properties 50-60 per cent. better than those of ordinary bricks. The increased cost of manufacture is out of proportion with the reduction in transport and handling charges but their subsequent development may yet open out great possibilities for healthy and economical building in the country.

Stone Buildings.

In the country naturally occurring stones are considered generally to be the best material for building and, when the stone is found on the farm, it is also thought to be the cheapest. However, this view is not borne out by the facts; even in the country, stone is one of the least suitable building materials for walls made with it become moist and cold very easily and, are thus not suitable for housing animals.

To ensure an equal thermal insulation it is necessary to have a stone wall 3 to 4 times as thick as a solid brick wall and this enormously increases the labour

in building and the amount of mortar consumed; thus the final cost is still higher than would be the case if lighter material were bought. One cannot advise too strongly against the use of stone for ordinary rural buildings.

Concrete Building.

On account of its poor thermal insulating properties, ordinary concrete is not suitable for rural building except for special purposes which do not include the housing of man or beast. It is very well adapted to the construction of basements and cellar walls but not to the construction of quarters intended for habitation.

In concrete construction, as with brick construction, attempts have been made to gain desirable thermal properties at the expense of resistance to compression which is particularly high and, for most purposes, much greater than is necessary. It has been found possible to prepare a large variety of light concretes, some made by the expansion of gas and some by the addition of light porous materials. Most of these light concretes have good thermal insulating properties but undergo considerable changes in size on setting and drying, particularly those prepared by the release of gas. Further, the use of this last method demands a very rigid control of the processes that take place between the release of the gas and the setting of the concrete to ensure that the pores are of the right size. Light concretes are most easily prepared by the addition of natural or artificial materials such as pumice stone, porous lava or sulphur-free ashes, a method which also has the advantage of minimizing the volume changes on setting.

The degree of accuracy that is required makes the preparation of concrete of such types from the very beginning a hazardous and complicated business; consequently it cannot be recommended; on the other hand, factory-made blocks of light concrete as well as bricks are now being developed.

Clay Construction (Adobe).

Clay is one of the oldest building materials but it has lost much of its importance in comparison with others. Resuscitation of clay construction has been tried but without general success because the different varieties of clay behave so differently when used and thus have to be handled differently in different localities; also the traditional craftsmanship has in many cases disappeared. The fatter a clay is, the more it sticks and the more impermeable it becomes but it also shrinks more in drying. Less fat clays have a more constant volume and are more easily worked but, on the other hand, they are more absorbent and less weather resistant. As a result, in spite of the low cost of the material and its excellent thermal properties, clay construction has only a local importance where the craft has survived or has been reacquired. A general resumption of this type of building cannot be expected.

Building with Wood and Fibrous Materials.

In recent years there has been a diminution in the amount of wooden construction, wood having become an important raw material for certain industries. On the other hand, the waste from these industries and other fibrous materials are being pressed into boards with the admixture of a large variety of adhesives and these boards are being increasingly used in building. On account of their good thermal properties, they are more often used as insulating coverings for walls than to form the wall itself. The use of these boards can be developed still further, especially for small buildings which do not have to support any very great weight.

Conclusion.

It is clear that the *density of building materials* will be an important question in relation to their future development in rural building. One must not be deceived into thinking that in the future there will be a place for none but light materials, for though the light building materials, of whatever type, are in general drier, more resistant to heat and cold, better ventilated and healthier than heavier ones, they are neither so strong nor perhaps so durable as the latter.

It is probable that a gradual change in the materials used will favour the tendency to build buildings with a larger ground plan rather than tall buildings. This tendency is slowly gaining ground in both rural and urban building.

H. J. HOFFEN

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MISCELLANEOUS INFORMATION

INTERNATIONAL AGREEMENTS FOR THE ESTABLISHMENT OF INTERNATIONAL GENETIC SYMBOLS — The International Genetic Congress which was held in 1932 at Ithaca (N. Y.), U. S. A., passed the following resolution that the genetic societies of all countries should make suggestions to arrive at a general and compulsory regulation of the symbols used in genetics. These proposals were to be brought up for discussion at the next International Genetic Congress.

Miss Tine TAMMES, Professor at the University of Groningen (the Netherlands), who was entrusted with the preparatory work, drew up, with the collaboration of Dr. H. DE HAAN, a report setting forth the proposals of the different countries that replied.

This preliminary work was passed on to the International Union for Biological Science which, with the support of the International Institute for Intellectual Co-operation, organized a meeting of delegates from the different countries interested. This meeting took place on August 14 and 15, 1939, at the headquarters of the Linnean Society at London under the chairmanship of Prof. M. J. SIKKS (Groningen). The following countries were represented: France, Germany, Great Britain, Hungary, India, Netherlands, Norway, Sweden, Switzerland and the United States of America.

The work of this meeting led to a full agreement on the definitions of the principal symbols used and on the establishment of exact rules to be followed in their application.

N. G.

THE INCREASE OF SOYA-BEAN CULTIVATION IN SOUTHEAST EUROPE — Since the publication of our monograph entitled "*Le Soya dans le monde*" (International Institute of Agriculture, Rome, 1936), the growing consumption of soya beans and their increasingly varied uses have given an extraordinary encouragement to the cultivation of this crop.

The countries that grow this crop on a large scale (Manchuria and China) are unable to supply the growing demand in Europe, inasmuch they are unable to accept all the goods that are offered in exchange, so that other countries that are interested in one way or another in the production of soya beans have tried to cultivate this plant and to adapt it to the climatic conditions in more or less cold countries by selecting early and hardy varieties. So far as regards the production of soya beans the results obtained are not remarkable.

As M. SCHUREN has shown in the journal *Der Vierjahresplan*, May 5, 1939, the countries of Southeastern Europe have benefited by this situation by extending the cultivation of the soya bean in the last few years. The following table shows how production of this crop has increased in Romania and Yugoslavia between 1935 and 1938.

		1935	1936	1937	1938
Romania	metric tons	11,000	27,400	58,000	52,000
Yugoslavia	" "	—	484	1,440	4,648

In 1934 German industry made extensive trials in soya bean cultivation in Romania. The success of these trials led to the formation of a company Soia S. A. R. at Bucharest and the company Uljarica in Bulgaria (December 1935). Both these undertook new trials in soya bean cultivation and concerned themselves in the sale of the products. The growers were guaranteed a fixed price and all the available beans were sent to Germany. In this way the latter country was able to cover a small proportion of its needs, the beans being brought from the neighbouring Balkan countries instead of from the Far East. In 1938, of its total imports of 783,000 tons, Germany obtained 717,000 tons from Manchuria, 57,300 tons from Romania, 4,800 tons from Yugoslavia and 3,200 tons from Bulgaria. Since 1936 the deliveries from Romania have increased to five times the original figure and Yugoslavia has progressed even more rapidly. It is interesting to note that the yield per hectare has increased markedly in Romania (5 quintals in 1935 to 9.1 quintals in 1938), the increase being due mainly to the choice of suitable land for this crop. The number of farmers growing this crop in Romania has increased so rapidly, on account of its profitability that, in the future, a rapid extension of soya bean cultivation may be expected if favourable soils are carefully chosen.

With the good yields that may now be obtained and a price of 5,000 lei per ton of soya beans sold, the Romanian farmer can now obtain a monetary return of 1000 lei more per hectare with this crop than is possible with wheat. Further, soya being a fixer of atmospheric nitrogen, can be profitably introduced into a rotation and thus the technical and economic dangers of monoculture may be avoided.

N. G.

THE INDUSTRIAL USE OF *ANABASIS APHYLLA* L. — In the stand of medicinal and industrial crops at the Agricultural Exhibition at Moscow (August 1939) *Anabasis aphylla* (French, *anabase*, English, *berry-bearing glasswort*; German, *Kalkzaut Salzbeere*) was exhibited as a plant that would become of importance in the national economy on account of its high content of anabasine ($C_{10}H_{14}N_2$), an alkaloid isomeric with nicotine and itself a violent poison. It was discovered in 1929. A special chemico-pharmaceutical laboratory near Chikment (Central Asia) produces an insecticide, anabasine sulphate, which has been used successfully on both state and collective farms (*Sovkhozi* and *kolkhozi*). The use of this new insecticide has been found more satisfactory than the employment of nicotine in the control of injurious insects.

Since 1938 experiments have also been made in hospitals with a medicinal preparation (methyl anabasine) as a respiratory excitant.

Anabasis aphylla is one of the chenopodiaceae and is characteristic of the semi-desert regions of the U. S. S. R. It has a green colour that contrasts with the colour of other plants of the same region and it is widely distributed in Kazakstan. It is a small bush having a stem with many branches, very woody at the base. The branches are twisted and very sappy, instead of leaves, at the nodes and the junction of branches, there is a small cupshaped swelling that is hardly visible. The plant blooms in October.

First of all, the roots were used but now the green branches are used in preference. These are gathered in the summer (end of June, beginning of July) when the aerial part of the plant is flourishing, the branches, tied up in bundles, are left to dry for 6-9 days and then with the aid of a machine and a sieve, the woody

parts are separated from the sand and small stones. The crude product is in the form of a fine colourless powder.

According to ZEMLINSKY (Soviet Tropics and Subtropics 1939, 8 43-44) allilanasine and its derivatives are very effective.

G S

MEASURES CONCERNING THE USE OF MILKING MACHINES IN GERMANY. — To compensate for the shortage of competent labour in Germany for milking by hand, the use of milking machines has been encouraged during recent years. However as is the case with other agricultural machinery, the economic success of these machines depends on certain methods of use and a degree of skill on the part of the operators. In consequence, every endeavour is being made to supply farmers with such types of milking machines as have been thoroughly tested and with careful instructions concerning their use.

To this end, the seventh order issued under the Milk Law of June 12, 1939, only allows the sale of milking machines approved by *Reichskuratorium für Technik in der Landwirtschaft*. The regulations governing such approval demand that the process of mechanical milking corresponds to the present methods of the dairy industry and has due regard for the health of the cattle. Particular importance is attached to the requirement that milking should be carried out rapidly and completely whilst at the same time the teats must be carefully handled, this excludes the use of very low pressures which are injurious to the health of the cattle.

Other requirements are

(a) the teat cups must adhere firmly for, if these fall frequently on the ground, there is considerable risk of contaminating the milk.

(b) the milk from each teat must be visible,

(c) the machine must be simple in construction so that it can be used and maintained easily by anyone accustomed to hand milking,

(d) the machine must be of sturdy construction, reliable and have a small consumption of power,

(e) if possible, standardized parts should be used and as far as possible home-produced materials should be employed.

By ensuring the fulfilment of these requirements it is hoped to avoid the failures which have hitherto occurred through the use of unsuitable machinery.

H J H

CARE OF PNEUMATIC TYRES. — In an interesting article in *Mitteilungen über Landwirtschaft* (Berlin 1939, No 24), the engineer LENGFIELD explains the cause of the great variation in the life of pneumatic tyres in agricultural use and shows how the normal life may be prolonged by careful handling.

The great advantages of pneumatic tyres on agricultural vehicles are already well known: tractors become available for different purposes and the drawbar pull is increased, whilst with farm carts there is a diminution in the necessary draught that may amount to 60 per cent. in comparison with wooden wheels; further harvester-binders fitted with pneumatic tyres are also more easily manipulated and thus able to be used on small farms.

By careful attention and great care it is already possible to use pneumatic tyres fitted to farm carts for 8 years, on the other hand it often happens that the tyres

become useless after 1 or 2 years of use. This difference is due to the difference in the treatment that the tyres receive although, of course, the nature of the soil has a considerable influence this may with a little skill be minimized for instance by avoiding deep ruts or ruts filled with sharp stones especially when the ground is frozen.

The factors governing the life of tyres are above all the following air pressure, load and the promptness with which small damages are repaired All these factors are controllable

Air pressure — Low pressure is a frequent cause of injury A tyre insufficiently inflated is too much compressed against the soil and the fabric under the rubber undergoes great strain due to deformation In time it separates from the rubber and in quite a short time the tyre is ruined The sign by which too low pressures may be recognized in the first place is the appearance of black marks at the edge of the surface where the tread rolls over the ground Soon some of the fibres break loose from the fabric which thus loses its texture, even before the tread of the tyre shows any sign of age or wear Under-inflated tyres suffer most on bad roads and stoney country roads because in this condition the tyre is easily torn

On the other hand, low pressures increase the adherence of the wheels of a tractor, both on the road and in the field, and so, as far as possible, pressures are lowered in such a case and one tries to use the minimum pressure allowable This pressure depends on the weight supported by the back axle of the tractor and every manufacturer indicates it exactly In general, it will be found that, for work in the fields, a pressure of 0.8—1.0 atmospheres is advantageous, but this pressure is not enough for heavy transport loads (beet, mangolds, wood, etc.) and for long transits where the pressure must be brought up to 2—2.4 atmospheres

It is always advisable to increase the pressure if the increase allows the force necessary for traction to be decreased, this applies in particular to farm carts where pressures of 3.4 5 atmospheres may be used according to the load carried, the size of the tyres and the speed

Load of carts — We have seen that for a normal load underinflation causes a deterioration of the fabric Now, when normally inflated, an increased load produces an analogous effect that is even more serious The fabric base splits usually along a zig-zag line and the tyre cannot be satisfactorily repaired A load of 12.5 quintals corresponds to a pressure of 3 atmospheres under ordinary circumstances and this pressure should be increased with the load according to the following table:—

Tyre Pressure	Load (quintals)
3.25 atm	20
3.50 atm	30
3.75 atm	40
4.00 atm	50
4.25 atm.	62.5
4.50 atm.	80

It goes without saying that, as the pressure and the load are increased, the size and strength of the tyres must be increased, whilst vehicles that are tractor drawn require in general stronger tyres than others on account of the increased speed.

Punctures. — Slight damage, cuts, punctures, etc. have to be repaired immediately because negligence in this may lead to irreparable damage that necessitates discarding the tyre.

Protection of the tyres. — Rubber is very susceptible to attack by oil, petrol and acid, all of which cause it to swell and lose its strength. Therefore care must be taken to protect tyres from these substances. In time, sunlight and air cause rubber to lose its elasticity and finally give rise to cracks; therefore, as far as possible, tyres not in use should be kept in a dark place to avoid this ageing. At the same time they should not be exposed to very low temperatures

H J H

COMPETITION FOR THE PREPARATION OF A DRINK PREPARED FROM GRAPE JUICE OR WINE. — With the aim of increasing the consumption of grape juice and wine, the Viticultural Sector of the *Federazione Nazionale dei Consorzi Provinciali degli Agricoltori* has organized a competition in Italy for the preparation of a drink fulfilling the following requirements,

(a) It must be made from wine or normal or fermented grape juice, in the last case, the alcohol content must not exceed 4 per cent. by volume.

(b) It must be stable, have a pleasant flavour and be innocuous in all respects

(c) It may be aerated or not, but in such a way that it may be served without addition or dilution

Flavouring with vegetable products is permissible

Prizes will be awarded to the three competitors judged to be most successful

G R

THE VALUE OF SUGAR IN HUMAN NUTRITION — Professor MULLER-LENHARTZ has published interesting data on the consumption of sugar in different countries in the *Zeitschrift für Volksernährung* (14 Jahrg., Heft 21, Berlin 1939, S. 296) The consumption of this article varies greatly in Europe and expressed in kg per person per year reaches the following values: Germany 22.6, France 26.0, Norway 29.6, Belgium 30.1, Holland 31.8, Eire 40.0, Switzerland 41.9, Sweden 41.9, Great Britain 47.7, Denmark 54.6. Amongst non-European countries the following are quoted: United States of America 47.6 and Australia 48.2.

The author maintains that, as a result of propaganda, the consumption of sugar has decreased markedly for sugar contains neither vitamins nor mineral salts. However, it must be remembered that of all foods sugar is the purest, its purity reaching 99 per cent.; further it is an essential food, for it is necessary to the operation of the muscles.

Above all, now that nutrition in Germany is largely based on fruit and vegetables, sugar is a valuable nutrient, for the other foods that are rich in vitamins and mineral, are usually poor in the other substances that are important for muscular activity

E G

YEAST IN HUMAN NUTRITION. — In an article by F. VERGIN in *Zeitschrift für Volksernährung* (Heft 19-21, Berlin, S. 279-296) the importance of yeast in human nutrition is discussed from various points of view. As fresh living yeast is not adapted

for prolonged use in human nutrition on account of its taste; dried yeast, which is a very high protein content food, has been used with success

Dried yeast has the following composition:—

Proteins	50 %
Non nitrogenous extract	30 %
Ash	10 %
Water	10 %

The proteins resemble those of meat and are very digestible. Their biological value is 80 (milk = 100). The value for meat on the same basis is 90, nuts, potatoes, soya beans and rice 80, oats 75, other cereals 50 (though the cortex has a higher value) whilst peas and beans have a biological value of 25.

The phosphoric acid content of yeast is largely made up of nuclear proteins.

The nitrogenous matter of yeast, as regards the amino-acid fraction, is intermediate between meat and vegetable proteins and all the essential amino acids are present

Further a sulphur containing protein glutathione has been found in yeast which permits a higher tolerance of carbohydrates by diabetic patients. The effect of glutathione, as an anti-diabetic, is completed and reinforced by the vitamin *B* complex. 100 grams of dried brewer's yeast contains 600-650 mgm of glutathione

The dry nitrogen free extract of yeast obtained from yeast contains gummy substances, glycogen and mucine

Another important point is the high ash content of yeast. The phosphorous is partly present as lecithin. The composition of the ash is Phosphoric acid about 65 per cent., potassium 32 per cent, magnesium about 34 per cent, calcium 2 per cent, silica 2.5 per cent

The phosphorus content is high compared with potatoes (1 kg of potatoes contain 1.6 gms of phosphoric acid and 1 kg of legumes about 2 gms).

The use of dried yeast and yeast extract represents an important source of phosphatides and lecithins

As regards the "trace elements" that are so important from a biological point of view in connection with the vitamins, iron copper and manganese are all found in yeast. The action of these elements is due to their taking part in enzyme reactions and their presence is essential to the formation of the photosensitive substances that have such an important role in metabolism.

As to vitamins, yeast contains all the factors belonging to the vitamin *B* complex. The factors *B*, *B*², *B*¹, *B*⁵, and *B*⁶ are present and *B*¹, and *B*² in concentrations that are relatively high in comparison with other foods.

Ergosterol, the substance which undergoes a change to form vitamin *D* is also present in yeast and so are vitamins *E* and *H* and the hormones

E. G

TUBERCULOSIS IN THE COUNTRY. — In a study of this important question made by Dr. G. ICHOK, Professor of Statistics at the University of Paris, and published by the Health Organization of the League of Nations, the author arrives at the following conclusions:—

(1) Tuberculosis is less prevalent in the country than in towns but there are numerous exceptions. Sometimes, in one country, there are certain rural districts that are more afflicted than others.

(2) The decline in mortality figures due to tuberculosis has been observed in the country just as in the towns but, in the latter case, the phenomenon occurred earlier and is now more marked.

(3) In general young women are more often attacked by tuberculosis in rural districts than in towns.

(4) The material collected on mortality due to tuberculosis arranged according to occupation does not provide any incontestable evidence, for the effect of the rural surroundings cannot be distinguished from the effects due to agricultural employment.

(5) Rural mortality due to tuberculosis cannot be considered alone but always, to some extent, in conjunction with urban tuberculosis as there are reciprocal effects between the incidence of infection in town and country and, similarly, between the intensity and mortality in the two environments.

(6) Until there is a sufficiently frank and sincere declaration of the incidence of tuberculosis in all countries, the necessary information relating to proportion of fatal cases can only be studied by the examination of "samples" of the population, consisting, for the most part, of children of school age. The investigations based on the tuberculin test show great variations of positive reactions in different villages in districts not considered generally tubercular.

(7) Amongst adults living in the country the tuberculin test becomes positive at times of interhuman contagion, particularly after a first contact with towns.

(8) Tests have also been made on conscripts which show a lower percentage of positive reaction amongst rural than amongst town men. Amongst rural men a change of tuberculin reaction is often found, either during or after military service; whilst, on the other hand, the proportion of negative reactions seems to remain about the same among town men during and after military service.

(9) The study of mortality figures for different age groups and sex in the country usually show a striking frequency of tuberculosis among young women and a lower frequency among men of mature age; this is the reverse of the observations made in towns.

(10) Rural emigration is followed by an increase in tuberculosis figures. The study of the origin of the cases treated in towns particularly women emphasizes the importance of the rural emigration problem and gives a valuable indication for anti-tubercular measures.

(11) On account of the consumption of fresh milk, particularly widespread in the country, the bovine tuberculosis bacillus seems to play a more important part in the propagation of tuberculosis in the country than in the town, especially as regards juveniles.

(12) A study of the material available on rural tuberculosis, both from official sources and from the work of different authors, shows that all the many aspects and factors of the problem are not treated in a way that might be desired. Also, there is a strong case for the adoption of the conclusions of the Tuberculosis Subcommittee at the Conference of the Directors of Institutes and Schools of Hygiene which met at Geneva in November 1937 and also for the encouragement of systematic and co-ordinated studies.

BOOK NOTICES *

LORD HAILEY, *An African Survey, a Study of Problems arising in Africa south of the Sahara* — Oxford University Press, London, New York and Toronto, 1938. XXVIII, 1837 pp., 17 tables, 6 maps.

[This important work on the problems arising in Africa south of the Sahara desert contains much material on agriculture and for this reason merits the attention of our readers. The idea of publishing a book on the principles applied by the different colonial powers in their administration, which is taken to include social work, legislation and education, was first proposed by General SMUTS at a conference held at Oxford in 1929. This suggestion was very well received and financial help from the Carnegie Foundation and the Rhodes Trust enabled it to reach fruition. Lord HAILEY, then Governor of the Central Provinces of India, was appointed chairman of a committee for the preparation of the work in question and under his able direction and with the careful collaboration of the members, a work was produced that will be, for many years to come, a source of information of the first importance.]

From the outset it was decided to exclude the countries bordering on the Mediterranean Sea, for these bear the imprint of a Mediterranean civilisation and present problems very different from those arising south of the Sahara. Quite arbitrarily, a line which follows the northern frontiers of French West Africa, French Equatorial Africa, the Belgian Congo, Uganda and Kenya is chosen as the limit of the area under discussion, thus excluding Italian East Africa, the Anglo-Egyptian Sudan and the islands Madagascar and Zanzibar.

The book contains 24 chapters treating different aspects of the African problem and a twentyfifth chapter summing up the essentials, so that a reader who is unable to study the whole work may be able to see, in brief, the opinions developed at greater length in the text of the book itself and to understand the relationship between the different aspects of colonial activity.

The future of Africa is largely bound up with the cultivation of the soil and the breeding of cattle, this preponderance of agricultural activity in the reason why almost all the chapters deal with agriculture. In order not to make this review too long we shall limit our remarks to the chapters that are entirely agricultural in out-look.

Chapters I and II deal with the physical background and the African people, and is a useful summary of the facts already known about relief, climate, vegetation and population.

Chapter XII, on the other hand, is quite new. The fundamental question of land tenure and a comparison of the different policies followed by the great colonial powers are treated in an extremely competent manner. Three different tendencies can be recognized:

(1) The policy followed in a group of states which have been influenced by the demand for land for European colonists and for mining interests (Union of South Africa, Rhodesia, Kenya and Nyasaland),

(2) the policy that seeks above all to develop native proprietorship (the remaining British Colonies),

(3) the policy of making grants of land or monopolies for trade in native products to individual Europeans or limited companies with a view to accelerating the development of the colony (the French Colonies and the Belgian Congo).

This is a generalization; there are always differences of detail between one colony and another which are not well known. The present work therefore does a great service in indicating the methods followed in each colony and tracing the development of the present systems of land tenure.

Chapter XIII is devoted to agriculture. The fundamentals of native agriculture and animal husbandry are treated and information is given on such subjects as the introduction of new animals and crops, game as a source of food, the development of native agriculture up to the present day, scientific research and the improvements that can be made in the native methods of agriculture.

The policy which is now considered to be the most profitable, would be to concentrate the attention, which has hitherto been devoted too much to the production of exports, to the production of edible crops. Shifting cultivation should be more closely studied and not condemned *a priori* for it is capable of improvement. Cattle breeding can also be improved, where the tsetse fly allows the keeping of cattle, and mixed farming methods, capable of being adopted by the natives, are also worthy of study; the improvement of the soil by the use of composts and green manuring should also be extended. The controversy, large estate v. peasant cultivator, though it is much discussed at the present day seldom arises in Africa, a number of crops do not give sufficient remuneration to encourage the laying out of large plantations and the best solution is to have such crops as cotton grown on small farms, care being taken to provide for supervision and control of sales.

Chapter XIV deals with forests which are of still greater importance in regulating water supply and maintaining soil fertility than as sources of timber. It is pointed out that it is necessary to make more use of forestry services and to provide them with larger staffs. The vital question of water supply is dealt with in chapter XV which also gives information on irrigation.

It is significant that a whole chapter, perhaps the most interesting, is devoted to the question of soil erosion, that is the ruining of land by the action of wind or water. Only in the course of the last few years has the importance of soil erosion been recognized but it is now appreciated that it is a world problem and that the fertility of a large part of the earth's surface is being destroyed by erosion. Africa presents a special aspect of the problem. No African colony can afford to neglect soil conservation in the future for, with the exception of a few mining areas, the people depend for their livelihood on the fertility of the soil, the improvement of the natives' standard of living, the avowed main of many of the colonial powers, will never be realized unless the soil is carefully preserved. In Europe one is accustomed to regard the fertility of the soil as a stable factor in economic calculations, this is not the case in tropical and subtropical countries. A careful examination of the different colonies is made to show that there is a real and almost general decrease in fertility. It is not always easy to distinguish between a loss of fertility due to natural causes, wind and water, and that which is attributable to human agency, agriculture or grazing. In Africa the two worst causes are operating, shifting cultivation and overstocking. The effects of these two factors have been sorely aggravated by the growth of the population during the present century, the concentration of the native population in reserves and the disproportionate increase in livestock. The measures to be adopted are clearly stated. These measures, which have been tried and found successful, are still far from being generally applied. A coordination of the efforts made in various colonies is also necessary.

It will be enough to say that the remaining chapters are devoted to health, education, economic development, co-operative organization, minerals and mines, transport and communications and to the organization of research work. A note in the chapter on economic development states that Africa only contributed 3.2 per cent. to the total world agricultural production between 1929 and 1933. It certainly seems that, with the immense area of the continent, in spite of the difficulties mentioned in the book, this surprisingly small figure could be increased by well directed efforts by the colonial powers; in other words, they should be able to develop agriculture and animal husbandry rationally by a sound policy that pays due attention to the needs of the native and the necessary conservation of the soil.

WORTHINGTON, E. B. *Science in Africa. A Review of Scientific Research relating to Tropical and Southern Africa.* Oxford University Press, London, New York and Toronto. 1938 XVI, 746 pp., 5 maps, VIII plates.

[This book can be regarded as a complement of the "African Survey" that has just been reviewed. The author was, in fact, entrusted with the preparation of a report on the progress of scientific studies on Africa as a preliminary to the former work. The first copies of this report impressed the members of the Committee for the Survey of Africa by its documentation and the convenient form in which difficult and heterogeneous data were presented, thus, the two books are complementary to each other. For a complete documentation on any subject it is necessary to consult both books and, whilst this is a disadvantage, it is compensated for by the fact that in many cases the same problem is examined from two points of view, which is a great advantage.]

What has been the rôle of science in the conquest of Africa? It seems to have been a very important one when all the work, in every branch of science, that is described in this work, is considered. However, the author warns us not to overestimate the influence of science on the development of Africa. Science did not precede the first colonizations, it followed them, railways were constructed without accurate maps, plants and domestic animals were introduced in the most varied regions without a previous study of the requirements of the country; the stock of the natives has increased enormously as a consequence of their raised standard of living but now the vegetable covering of the soil is being everywhere destroyed as a result of overstocking and this, in turn, is leading to soil erosion by water and wind. Thus, the development of colonies has hardly yet started to follow the lines indicated by the deeper knowledge which has resulted from scientific researches, nor are the possibilities offered by the soil of Africa fully exploited. It is important to form an opinion on the rôle that science could play in the economic conquest of the Dark Continent. This is what the author tries to do in the first chapter of his book. He examines the relations between the different branches of science, relations that are much more easily seen in the new countries than in Europe, where exaggerated specialization has masked the essential unity of science. The following example is given to show this relationship between the sciences. Trypanosomiasis of cattle are spread by the tsetse fly; the control of this disease is primarily the concern of the veterinary officer, then, in the second place, of the entomologist who is called upon to make a systematic study of the vector, and the ecologist who studies the mode of life of the tsetse flies and their surroundings. Finally, the soil conservation expert will add his word on the damage that is caused by the denudation of the land in consequence of the destruction of the bush that harbours the insect.

Science has to keep pace with the rapid changes that take place in nature and in the human population of Africa as a consequence of the penetration of the white man. As examples, the advance of the Sahara towards the South and the settling of native tribes that have given up shifting cultivation may be cited. Others are the creation of mining districts, which has given rise to a black proletariat, and the influence of modern forms of transport on the spread of diseases.

The author discusses the coordination and centralization of scientific research. It would seem that in the British Colonies there is a tendency to separate the scientific and administrative services, a practice that offers some advantages for it is difficult to carry out a long programme of research if, at the same time, small questions of every-day routine must also be dealt with. On the other hand, research workers do not benefit if they are too completely insulated from practical problems. The training of technicians for colonial service is another problem that has been solved in various ways. Research workers are necessary (e.g. botanists, zoologists, veterinary officers, agricultural engineers, etc.) and so, on the other hand, are agents for agricultural propaganda. The author also talks of the "waste of research work"; here, where we are engaged on the collection and coordination of the results of research in tropical agriculture, we agree with the author when he complains that the publication of data that is often of great interest occurs in official annual reports where one would expect information of an administrative nature. Further, there is a noticeable lack of contact between research workers in different African countries but here acknowledgment must be made of the valuable services performed by the various Agricultural Bureaux of the British Empire.

The sciences dealt with are cartography, geology, meteorology, soil science, botany, silviculture, zoology, ichthyology, entomology, general agricultural science, the study of crop plants, plant industry, animal industry, health and medicine, human diseases, health and population, and anthropology. All those interested in African agriculture will often have need to consult the chapters on soil science, agriculture and animal breeding, whilst much other useful information is to be found in the other chapters. Thus, the research on forage plants is included under botany and food crops under public health.

It will be sufficient here to indicate the chapters that deal entirely with agriculture. The reader will be struck with the diversity of the problems that arise in Africa, the soil problems are those that are encountered in other tropical countries but the causes of the deterioration are peculiarly African, they are shifting cultivation and overstocking, and, to some extent, burning of forest or grassland. In the chapter on cultivated plants the author reviews the researches already accomplished and insists on the necessity of concentrating work in the future on edible plants. These studies should include work on the numerous strains of each plant, which should be investigated in relation to their adaptation to local conditions, and work on the improvement of cultural methods, the control of disease, the nutritive value of edible plants and selection to obtain an improvement of yield as well as an increase in feeding value and improved resistance to disease.

In the chapter on the methods of cultivation an interesting account, of the problems of shifting cultivation is given and another on the possibility of improving native agriculture (by means of green manuring, crop rotation, mixed cultivation, composts, stock and arable farming worked in conjunction, the formation of native cooperative societies and agricultural education). The section dealing with European plantation work is much less extensive.

Every one knows the importance of animal breeding in African economy and, perhaps rightly, one thinks of Africa as a continent where stockraising will surpass other industries in importance. On the other hand, it is recognized that the numerous diseases that occur are the principal factors limiting the size of herds. Nowhere in the world are animal diseases studied with greater interest than in South Africa. The Union of South Africa leads the world in its institutions for veterinary research. Naturally, the diseases of domestic animals have a prominent place in this work. The other problem already mentioned is overstocking which is acute in all stock breeding regions and which is in some cases due to the fact that domestic cattle replace money in the native economy.

In a passage referring to the International Institute of Agriculture, the author affirms that only a small part of our work is devoted to the problems of Africa. This statement is fair though the author is not completely informed of our activities in this field. The "African Survey" and this book make it clear that whilst there is no lack of competent research work on Africa, intellectual cooperation between the colonial powers is still inadequate. Our Institute should become in this respect a centre for the study of agricultural problems in the same way as the Health Organization at the League of Nations is a centre for the study of medical problems. This Institute, through its Tropical Section, will willingly give its support to any attempt to bring about such an international coordination of research in agricultural science.

W. B.

Prof. UGO PAPI, *Segretario generale dell'Istituto, Direttore responsabile.*

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MONTHLY BULLETIN

OF

AGRICULTURAL SCIENCE AND PRACTICE

CITRUS GROWING IN ALGERIA

I. — General.

It is thought that the orange tree was introduced by the Genoese and Portuguese navigators who brought it from China in the fifteenth century, the mandarine on the other hand has only been cultivated since 1850 when it was first grown by the "Jardin d'Essai" at Hamma near Alger. Only since that year has the cultivation of citrus fruits developed in the département of Alger, principally in the district of Boufarik.

At the present day the principal commercial fruit gardens are situated in the coastal and subcoastal plains. The cultivation of citrus fruits is almost entirely concentrated in the plain of Mitidja, the Bône region, the neighbourhood of Philippeville, the Valley of the Sig and in the districts around Misserguin, Perrégaux Relizane and Ferme Blanche. The area that was devoted to citrus cultivation in 1938 was 11,300 hectares, of which 6,300 hectares were planted with oranges, 4,500 hectares with tangerines and mandarines and 500 hectares with lemons. Production varies within a small range and is about 1 million quintals per year, including 500,000 quintals of oranges, 450,000 quintals of tangerines and mandarines and 50,000 quintals of lemons. That is to say, about half the citrus production of Algeria is oranges and rather less than half tangerines and mandarines and the remainder is lemons (50 %, 45 %, and 5 % respectively).

2. — Varieties.

There are many varieties of orange but they may be classified into three groups, early, second early and late. The Navel oranges belong to the first group and are represented by Washington Navel and Thompson Navel. The former is more suitable in the coastal regions whilst the other is preferred in the drier and warmer parts. The fruits of these varieties, which may safely be left on the trees till February, arrive on the European market towards the end of November. In the second group, which is the most important, oranges of the Mediterranean type are found. Such fruits as Fine Maltese, Blida, and Beni Salah, which fall in this group, are the mainstay of Algerian citrus culture; among the blood oranges there are Portuguese half blood, a fine variety that attains its best development at Philippeville and Perrégaux, and the Round Blood Orange which has good red flesh and has been greatly appreciated in the last few years. The varieties Portuguese and Maltese ripen in March but they may be left on the trees until August without deteriorating and so these may almost be classified with the late varieties. The third group is represented by

Jaffa and Valencia late, the former gives very fine late oranges but it seems that it will have to be abandoned, not being a profitable variety commercially on account of its great size.

The citrus growers' "syndicats" are further encouraging trials with other good varieties, such as the Spanish varieties, Cadenera and Verna, the Algerian Round Blood Orange and Florina.

One variety of mandarine is cultivated almost exclusively, the Clementine or Tangerine which occupies 44.6 per cent. of all the land planted with citrus and 99.4 per cent. of that planted with mandarines.

The tangerine is a very interesting hybrid that has a future in Algeria. It was obtained by Père Clément about 1900 at the Orphelinat agricole de Misserguin (Oran) and now is chosen for entire gardens in all three départements of Algeria. It owes its popularity to its early ripening and the fine colour of the fruits which are juicy and sweet. According to the researches of Dr. TRABUT at the Botanical Station at Maison Carrée, the clementine should be considered as a hybrid between a long leafed variety of *C. bigaradia*, le Granito, which was imported from Spain and which grew in proximity to the mandarine trees. On the other hand, the American geneticist Prof. WEBBER considers that the tangerine is a hybrid of the mandarine with the sweet orange. Nevertheless, other geneticists (FAUVEL, GUILLOCHON and others) who have also studied the question are in agreement with the view adopted by TRABUT.

The varieties of lemon are less numerous for this is a crop that has been only very recently introduced. There are several American varieties (Eureka and Villefrance) and Italian varieties (Sicilian), but that favoured for export is the variety Eureka.

It is thought that a variety of grapefruit, Marsh Seedless, should yield a quite considerable production. The varieties of citrus cultivated in Algeria allow production and exports to continue from October till the end of May.

The Algerian Government Botanical Station at Maison Carrée, near Algiers, has introduced and is trying to popularise a considerable number of citrus varieties of American origin (Golden Buckeye Navel, Centennial, Pearson-Brown, Pineapple and others).

Citrus fruits are an important item in the export trade of Algeria at the present time and a great propaganda campaign is in progress with a view to popularising the best methods of cultivation and to standardise the varieties now cultivated by reducing their number. The future of Algerian citrus cultivation is closely bound up with the production of a reduced number of commercially selected types of a fixed botanical identity.

The vine and wine crisis which has afflicted Algeria during recent years has had the effect of turning agriculture more and more towards the production of fruit. With favourable soil and climatic condition and suitable water supply, such cultivation can in fact give a good return but, in spite of this, in the beginning many orange gardens were laid out with unsuitable varieties of orange of doubtful productivity. Even now not many nurserymen have at their disposal the necessary quantity and quality of trees to make a satisfactory selection of both root stock and scion possible.

3. — Root Stocks.

The root stock most widely used is the *C. bigaradia* R, on account of its resistance to "maladie du pied" (gommosis). For the same reason the rough lemon is also used, though still on a small scale; this plant is thought to be a hybrid between *C. limonum* R and *C. decumana* L. In Florida this is a very popular root stock in comparison with *C. bigaradia*, on account of its resistance to gommosis and the splendid development that the tree attains. Also, during the first years of production, the fruits are large and the shoots are thicker than is the case with scions grafted on *C. bigaradia*. Lime citron is also used as a root stock; this plant is thought to be a hybrid of *C. medica* L. and *C. limetta* R, both of which are resistant to gommosis, but Dr. TRABUT recommends it only for healthy and sandy soils.

The sweet orange (Meski) and the lemon are often employed by the natives as root stocks but both of these are more susceptible to gommosis, particularly around the roots.

In general, budding is practiced and may be carried out any time from May till the hot weather in July.

4. Cultural Methods.

The season for planting extends from April to June. In general, the distance between the trees on the plantations of European growers is fairly great, even in comparison with the usual practice in other citrus growing countries; lemon trees 10 m apart in each direction, *i. e.* 100 trees per hectare, orange trees, 8 m between trees and 10 metres between the rows, *i. e.* 120 trees per hectare and mandarine trees, 6 m between trees, 8 m between rows, *i. e.* 150 trees per hectare.

The natives plant the trees more closely and such thickly planted orange gardens cannot be maintained for many years because the growth is soon hampered by the competition which ensues. This has a bad effect on fruit production. Further, insect parasites, particularly the scale insects, and fungus diseases attack the trees as a result of the poor aeration between them.

Inter-row cropping, particularly with annual leguminous plants, is practised during the first few years. In spring (February-June) runner beans, broad beans, peas, and strawberries are to be found cultivated in this way; in the summer melons are frequent; shaded by the foliage of the trees, this last crop grows particularly well.

Every third year a good dressing of farmyard manure is given and in the intervening years inorganic fertilisers are used. Liming is recommended for old orange gardens which have had applications of dung over a long period for, in such cases, the soil tends to become acid. M. GUILLOCHON advises the following as an average treatment for a tree 5 years old: nitrate of soda 500 grs, superphosphate 1 kg, sulphate of potash 350 gm. These quantities are increased as the tree grows and, bearing in mind its condition, it may be reckoned that the necessary increase for each successive application is 150 grams of each constituent. The

first application must be made when the shoots and leaves are growing, the next two in summer and the last in September.

As the tree grows older and fruit production increases, potassium plays a more and more important part in its metabolism. M. GUILLOCHON records the observation, made by many citrus growers in the South of France and North Africa, that the application of potash fertilisers reduces fall of fruit after pollination.

The citrus gardens of Algeria must be irrigated, the number of irrigations being 12 to 16 per year, made for the greater part between June and September. The amount of water used per hectare and at each watering varies considerably from one garden to another and usually is about 700-800 cubic metres, according to the composition of the soil and the position of the garden. The number of irrigations depends on the amount of water given each time. It may be reckoned that the annual water requirement of a garden in full production is between 4,500 and 5,500 cubic metres.

Citrus cultivation is an expensive form of horticulture; purchase and exploitation of one hectare worked for 8-10 years costs about 30,000 francs whilst the working costs, with moderate cultivation, and manuring amount to 5,000 francs.

The orange gardens near the coast are threatened, particularly in winter, by the violent winds from the sea ("embruns"), which wither the tips of the young branches and cause the fruit to fall. To minimise this danger, use is made of windbreaks. In Algeria the cypress (*Cupressus pyramidalis* L.) is grown for this purpose but, on account of its slow growth, tamarix bushes (*T. articulata* Wohl) are planted two metres apart in rows parallel to the cypress trees and five metres from them. These tamarix bushes grow very rapidly and, from the first year, they provide adequate shelter for the young orange and mandarine trees that have just been planted; when, three years later, the cypress trees are tall enough to protect the fruit trees the tamarix bushes are uprooted and sold for fuel. The cypresses are planted 1.50-2.00 metres apart along a row; young trees, 2 years old, grown in pots are sold by the nurserymen for this purpose.

If the tamarix is not used as a temporary windbreak it is necessary to plant the cypresses in January, two years before the orange trees; during the intervening time the land is used for the production of annual crops - usually market garden crops.

5. — Standardisation and Marketing.

Selecting and standardising the product for export have been the subject of copious legislation but it is now regulated by the law of April 20, 1939 (¹), which cancels all previous laws on this subject. In order to be approved for export, the fruit must be healthy, of good quality, marketable and free, at

(¹) *Journal Officiel de l'Algérie*, Alger, 28 avril, 1939 n° 17, p. 1153-1155.

the time of sending, from visible or deep attacks of *Ceratitis* or fruit fly. The sending of boxes of fruit seriously damaged by frost, *siroco* or other inclemency of the weather, insects, or other parasites like sooty mould, and of fruit showing signs of mouldiness or decay, or mechanical damage that impair its keeping qualities, is prohibited. Five per cent of fruits not complying with this specification is tolerated in the quality "marchande" (= marketable). All consignments, in whatever packing they may be, must be homogeneous as regards variety, quality, ripeness, colour, etc. The fruits are classified for export in three qualities, "Extra", "Standard", and "Marchande" (marketable). For each quality there is an exact specification and the tolerance admissible is also stated. Unclassified fruit may be exported under the description "Tout venant" (= all coming). In the same way there is a specification for each species of citrus giving the degree of ripeness, percentage of juice, condition, arrangement in the packing, packing and labelling. All consignments must bear marks indicating the origin and nature of the produce, the quality, the commercial type, the number of the size and the identity of the exporter.

Export control is carried out by *l'Office Algérien d'Action économique*, or *Ojalac*.

The present exports reach a mean of 700,000 quintals of citrus fruit per year, that is, 70 per cent. of the production. Of this total, 340,000 quintals are oranges and 360,000 quintals are clementines (tangerines). The value of the fruit is about 100,000,000 francs and almost all the export is absorbed by France. The selling season is from October to May (end of October – beginning of February for mandarines, November–December for Navel oranges, December–end of May for second early and late oranges).

The shipping companies and railways have arranged special rates for the transport of fruit from North Africa to the metropolis. For example, the National Railway Company (*La Société Nationale des Chemins de Fer français*) has instituted new tariffs which came into force on November 25, 1938, these inclusive tariffs cover transport of citrus fruits from the principal ports of Algeria to the principal consuming centres in France and all other incidental expenses in transit.

A decree of July 15, 1939 set up the "Union des Syndicats obligatoire des Producteurs des Agrumes". This union has its headquarters at Alger. The three citrus producers' associations of the départements Alger, Oran and Constantine were compelled to form this union, the aims of which are: (1) to enable the united associations to co-operate in the study and defence of the interests of citrus cultivation; (2) to provide the associations with a permanent centre; (3) to communicate to the associations any information coming from the interior or abroad which may throw light on the position with regard to markets, crops, supply and demand, etc.; (4) to represent the interests of the trade before the public authorities and, for this purpose, to give all useful instructions and directions to the associations; (5) to undertake and encourage all studies or work relating to the production of citrus fruit. To carry out these aims each association must make a minimum contribution of 15 frs. per hectare to the union.

The development of citrus cultivation in French North Africa and particularly in Algeria has been considerable during recent years and it is thought that it will continue to grow in the immediate future. This applies particularly to oranges, for the French market still offers possibilities. During the period 1936-1938, France imported on an average 2,800,000 quintals of citrus fruit of which 900,000 quintals, that is to say about one third, came from the French colonies. Of 2,000,000 quintals of oranges imported, only 600,000 came from the colonies and of the 200,000 quintals of lemons imported only 30,000 quintals came from the colonies. France's requirements of mandarines are at the present time almost entirely satisfied by the colonies, mainly by Algeria (95 %). Nevertheless, it must be remembered that a great part of the citrus gardens of the French colonies, especially those of Algeria, are not yet in full production and the output will be doubled in a very few years. On the other hand, France cannot exclude the citrus fruits of other countries from her markets without having her own exports to the countries concerned similarly treated.

All this is understood by the French Ministry of Agriculture which set up a National Citrus Committee (*le Comité national des Agrumes*) by a decree dated July 5, 1938. The purpose of this committee is to regulate the citrus fruit production of the North African Colonies and it is made up of properly qualified representatives of Algeria, Tunisia and Morocco, who are to study and draw up measures relative to the organisation of production and of foreign and internal trade in citrus fruit. The principal aim of this decree is to co-ordinate and regulate the possibilities of the citrus gardens for, if measures are not taken in time, a problem will arise in a few years similar to that which arose only a short time ago as a result of the thoughtless extension of the vineyards of Algeria.

6. — Conclusion.

From what has been said in this short article it is possible to draw the following conclusions

(1) Algeria still has suitable land, as regards soil and climate, for the cultivation of citrus, and subsequent development depends on the possibility of irrigation and the economic disposal of the product.

(2) At the present time the French market still offers opportunities for exports of oranges, lemons and grapefruit but the market for clementines and mandarines is nearly saturated. However, on account of the earliness of these fruits the other European markets still have great possibilities.

(3) Production must be strictly controlled and the number of plantations must be limited or profitable marketing will become difficult later.

(4) The growing production of citrus fruits in Algeria and of the other colonies and protectorates of France in North Africa is slowly eliminating citrus fruits from other European countries, particularly Spain and Italy, from the French market;

(5) The output of citrus fruits will be considerably increased within a few years as the majority of the plantations are not yet in full production.

(6) The selection and standardisation of the fruits and the rapid transport to the metropolis are now almost perfected

(7) Standardisation of cultivation will enable a uniform product to be obtained and will lower the cost of production

(8) The future of citrus cultivation in Algeria depends on the reduction in the number of commercial and botanical varieties to a small number of well defined types

A. PASCAI

ORGANISATION OF MILK RECORDING IN DIFFERENT COUNTRIES

Introduction.

The International Institute of Agriculture has frequently taken up the question of milk recording in different countries and in 1924, published a monograph on the subject under the title "Dairy Cow Testing throughout the World". Immediately afterwards, in 1925, a new enquiry was started which lasted over several years and led to a new edition in 1935 which was drawn up in an entirely different form. The initiative of the International Institute of Agriculture was appreciated by the specialists and the Eleventh International Dairy Congress passed the resolution "*that the International Institute of Agriculture Rome should submit to each International Dairy Congress a tabular summary of the state of milk recording in all countries*".

Acting on this resolution the Institute organised a new enquiry on a still wider basis with the intention of publishing a new edition of the above mentioned work. The present difficulties will not permit us to promise this publication in the near future so it has been decided to publish the reports that have been received from official sources as a series of articles in the *Bulletin*. These articles should however, be considered as chapters of the work 'Dairy Cow Testing throughout the World' and as such supersede the corresponding chapters of the volume published in 1935.

From time to time, articles will be published on countries that do not figure in the previous work whereas further and fuller notes on the important changes that have taken place the countries already treated will be published as they become available.

I — Netherlands ()

Development of Milk Control.

The first milk control association was founded in Friesland in 1899 but for the Friesian Herd Book ("Het Friesch Rundvee Stamboek") a number of cows were controlled earlier in 1893.

(*) This article was sent by the Director General of Agriculture at the Hague and was submitted on November 6, 1939, by the Delegate of the Netherlands and the Netherlands East Indies on the Permanent Committee of the International Institute of Agriculture.

The development of official control can be seen from the following summary:

Year	Number of Associations carrying out Official Control	Number of Controllers and Samplers working on Official Control	Number of Farms Controlled	Number of Cows Controlled	Percentage of Cows Controlled
1910	244	...	...	...	...
1914	347	...	...	...	...
1916	425	...	...	...	...
1918 . . . . .	...	...	...	...	...
1920	469	...	...	...	...
1922	497	...	12,733	156,327	14.4
1924	553	...	14,760	183,861	16.8
1926	725	...	(a) 10,624	217,051	19.9
1928	694	...	(a) 12,593	243,971	18.8
1930	686	...	15,367	136,007	10.5
1931	765	...	15,825	164,433	12.6
1932	781	...	15,185	159,157	12.2
1938	878	782-1210	23,229	202,843	13.2

(a) Friesland and 17 Control Associations not included.

In addition to the official control there is, in the Netherlands, an additional, unofficial control. The number of cows unofficially controlled in 1938 was about 178,000, thus, altogether 25 per cent. of the total herds were controlled. In the unofficial control the milk samples are taken by the farmer himself and not by the recognised inspector. The unofficially controlled cows also include those which are controlled in Friesland but which are not entered in the Herd Book although the control is according to the provisions there laid down. In Friesland, only those cows that are entered in the Herd Book are considered as being officially controlled.

Organisation of Milk Control.

Milk control is carried out through control association or factories for dairy products. The examination of the milk must be carried out by a person holding a diploma, the "Diploma van Melkcontroleur", issued by the Netherlands General Dairy Federation (Algemeene Nederlandsche Zuivelbond, or A. N. Z.) or by a National Agricultural Adviser (Rijkszuivelconsulent or Rijksveeteeltconsulent) or else another diploma that is recognised as being equivalent. The weighing of the milk and taking of samples may be carried out by a sampler who is the representative of the controller but the latter is nevertheless considered responsible for the satisfactory conduct of the whole work.

In each Province the Provincial Animal Breeding Committee (Provinciale Commissie voor de Veefokkerij) has set up a central control service that supervises the activities of the breeding and control associations. The supervision is carried out by the national dairy or animal breeding adviser (Rijksveeteeltconsulent or Rijkszuivelconsulent) in the province or by an official appointed by the

Provincial Committee who works in consultation with the advisers. The supervision is carried out by (a) the control and analysis of milk samples (b) the control of test milkings on the farms (c) the control on the keeping of milk registers (d) the control on the dairy and breeding associations.

The milk registers of each control association must be approved by the control services already named. In particular cases, on the recommendation of the appropriate official, the Milk Register Committee set up by the Agricultural Department may decide that certain milk registers that cannot, in their present form, be approved by the said official, shall be recalculated and authorised. In the event of such a question arising each case must be considered on its own merits.

In the province of Friesland the official control is carried out according to the provisions laid down in the Friesian Cattle Herd Book; the official control only includes animals registered in the Herd Book whilst the unofficial control includes animals not so registered but the control in most cases follows the same lines. The Chief Control Service is carried out directly by the Friesian Cattle Herd Book Society. (Friesch Rundvee Stamboek).

In the other provinces, as a rule, unofficial control is not in accordance with the regulations that are laid down by the Chief Control Services of the province. In the majority of cases the samples are taken by the farmers themselves without any further control; these samples are, for the most part, analysed at the Dairy Factory where, as a rule, the milk registers are also kept.

Cows controlled for the first time must be provided with a number or three distinguishable signs which refer to the page of the register referring to the animal in question. These numbers or signs are allotted by the controller or the sampler and are to be found on the animal's right horn.

The size of the control associations varies considerably, the number of members varies from 3 to 185, and the number of controllers and samplers is between 1 and 19 per association.

Most of the Associations are only concerned with milk control; others are Breeding and Milk Control Associations and in addition to milk control all the breeding is registered by such associations. In Friesland there are hardly any but milk control associations.

The amount of work undertaken by the different associations also varies considerably and is not confined to certain determined subjects. The funds of the associations are obtained mainly from members' subscriptions though in some cases additional financial assistance is obtained from the factories and in a few exceptional cases from the agricultural organizations and the municipality.

Milk inspection methods.

According to the regulations laid down for official control in all the provinces except Friesland, the weighing of the milk is carried out every 2,3 or 4 weeks by a controller or sampler using a spring balance that is checked at least once every three months.

A 40 ccs sample of the milk is preserved by the addition of a little potassium dichromate and the samples examined must be kept for two days so that

the examination may be repeated if necessary by the Chief Control Service; this regulation does not apply to Friesland where the samples need not be kept.

If the samples are kept a half or a whole day on the farm the controller must ensure that there is a box provided with a lock for this purpose.

The daily sample for the determination of the butter fat content must be made up of morning and evening milk in the proportion that the milk is produced at the test milkings. The fat must be determined by Gerber's method and, whether this is carried out at the Dairy Factory or at the house of the controller, the apparatus and the necessary materials for the test must be checked by the A. N. Z. (The Netherlands General Dairy Federation.)

The number of days between one control day and the next is fixed in each province by the Provincial Cattle Breeding Commission (Provinciale Commissie voor de Veefokkerij); it is usually 2 to 3 weeks. In Friesland the control days recur every fifteenth day. In other respects also the regulations in Friesland, which are laid down by the Friesian Herd Book, are only slightly different from those in other provinces.

The milk is weighed in Friesland to the nearest 0.2 kg whilst in other provinces it is weighed to the nearest 0.5 kg. The controller is bound to carry out the control himself once each day and the milk samples from both sampling times is put into one bottle, not into two separate bottles as is the case in other provinces.

Official control takes place every 2 or 3 weeks and the unofficial control every 2,3 or 4 weeks. In Friesland the official control is on the fifteenth day after the previous control. The samples are taken on the morning and the evening of the same day or else on the evening of one day and the following morning; only the fat content is investigated, the other constituents are not determined.

Calculation of the Results.

In calculating the results of milk recording due regard must be paid to the regulations laid down for official control in all provinces except Friesland.

The quantity of milk given on the day of calving must not be included. If, for example, the cow calves on March 1 then the evening milk of March 5 is the first that is controlled although March 2 is the first day of lactation.

The end of the lactation is given as the day after which the cow is not milked. If this is more than 7 days after control which is carried out fortnightly, 10 days after control which carried is out each 3rd week or 14 days after control when it is carried out each fourth week, then it is considered that the cow was not milked again 7, 10 or 14 days after the last sampling day. If a cow gives less than 2 kg milk per day it is considered "dry".

The yield in kilos of milk, fat content and yield of butter must be reckoned as beginning with the day after calving and continuing over the whole lactation.

The mean daily yield is found by dividing the total yield on the test days by the number of test days.

The total yield is found by multiplying the mean daily yield by the number of days on which the cow is milked.

The mean fat content is found by dividing the number of kilos of milk on the test days into the number of grams of fat on the test days and then further dividing this quotient by 10.

The total yield of fat is found by multiplying the net content in gms per kilo by the number of kilos of milk.

The mean daily yield of fat is found by dividing the number of test days into the total yield of fat on the test days.

When control takes place every four weeks the lactation period is considered to be divided into 28 day periods and the test days to be in the middle of these periods; the first half of the period between two test days is considered to belong to the previous period and the second half to the following period. When the first control in the lactation occurs more than 14 days after calving a special control method is used.

In Friesland the length of the lactation is reckoned as the number of days between the third day after calving and the day after which the cow is not milked again. The last milk day is the same as the last day on which evening control takes place (In Friesland it takes place in the evening and on the morning of the following day).

However, if a cow is milked for more than 330 days then the register must be closed and calculations made as if the number of days in the lactation is between 316 and 331.

Instead of the total yield it is usual, in Friesland, to calculate the yield of butter as follows:

$$\text{Kgs Butter} = \frac{[\text{fat content (\%)} - 0.20] \cdot 1.15 \cdot \text{Kgs milk}}{100}$$

Registration of the results of control.

The following particulars must be given in the control books:

- the name of the owner,
- the name, control number and Herd Book number (if there is one) of the cow,
- the date of birth of the cow,
- the date of calving,
- the date of the previous calving,
- the date of the end of the previous lactation.

For each sample taken:

- the quantity of milk,
- the fat content and the number of grams of fat,
- the mean yield per day,
- the total yields,
- the mean fat content,
- the total yield of fat, (or in Friesland the yield of butter),
- the length of the lactation (number of days).

and finally there is a column for remarks where the particulars of each animal must be recorded as accurately as possible, such as for example; illness, oestrus,

covering, stalling, grazing or anything else that might reasonably affect the yield of milk.

As a rule not more than two control days in a lactation may be missed and in no case may six weeks elapse between two consecutive test days.

The Use of the Results of Control.

The ultimate use of the data is in the guidance of selection in private business. In the case of animals officially controlled and worthy of inclusion in the Herd Book or the offspring of pedigree cattle, the results are entered in the breeding register. These books are always available for consultation by interested persons and the results of the control of the official pedigrees of the animals are also entered.

The Dutch Cattle Herd Book Society (Nederlandsch Rundvee Stamboek) which has members all over the country, except in Friesland, has introduced the term "Keurstamboek" (= picked pedigree) which is applied to cattle that fulfil certain minimum production requirements and also reach a certain standard with regard to points of external appearance. The animals must be already in the Herd Book and two milk tests of the cow in question must be known to the N. R. S.

Both the Dutch Cattle Herd Book (Nederlandsch Rundvee Stamboek) and the Friesian Cattle Herd Book (Friesch Rundvee Stamboek) have instituted so called "preferent" (= preferred or chosen) certificates for bulls. A distinction is made between 1st and 2nd class. In the register of "preferent" bulls, only such animals may be entered as can be shown to have an improving influence and to decide whether this is so or not their offspring are compared—as far as this is possible—with their dams both in respect of external appearance and performance.

Studies of the inheritance of productivity of cows and investigations concerning bulls.

In Friesland for several years a study of the inheritance of the property of producing milk with a high fat content has been in progress. This investigation is being carried out by Dr. Ir. B. J. B. GROENEVELD under the aegis of the Friesian Cattle Herd Book; a full report on this work can be found in the Reports of the Eleventh World Dairy Congress, Berlin 1937.

The value of a bull for this purpose is found by comparing the results obtained by his offspring with the performance of their mothers. The mean fat content of the milk from both mothers and daughters are plotted in graphs of a special type that have been devised for the purpose. The mothers milk is plotted vertically and the daughters milk horizontally from left to right so that, if the mother gave milk of a mean fat content of 3.34 % and daughter milk of a mean fat content of 3.79 per cent., this is represented by a point 3.34 units above the horizontal axis and 3.79 units to the right of the vertical axis.

Cows are divided into 9 classes according to fat content of their milk as follows:

Class	Fat content of Milk %	Class	Fat content of Milk %
0	2.70-2.90	5 ,	3.70-3.90
1	2.90-3.10	6 ,	3.90-4.10
2	3.10-3.30	7 ,	4.10-4.30
3	3.30-3.50	8 ,	4.30-4.50
4	3.50-3.70		

For this classification it is assumed that the fat content of the milk of Friesian cows varies between 2.70 and 4.50 per cent. when they are kept in normal conditions and fed in a normal manner. By "normal" one understands "according to the conditions and methods that obtain in practice in the region under consideration".

Inheritance is thought to follow the following lines:

(a) All cows tend towards a minimum fat content which lies between 2.70—2.90 per cent.

(b) The inheritance of a higher fat content depends on four independent factors of similar value, the homozygous form of these factors having twice the influence of the heterozygous form.

The bulls that have a "preferent" certificate are always clearly indicated in breeding registers, pedigrees and in catalogues.

SURVEY OF THE HUMAN NUTRITION PROBLEM UNDER PRESENT CONDITIONS

Evolution of the nutrition problem.

Although we have no information on which to base a mental picture of the living conditions of primitive man before the discovery of fire and the first attempts at agriculture, an idea may, however, be obtained of the food resources available at that time from a list of the edible animal and vegetal products now existing in certain wild regions.

In those regions where natural conditions have remained unaltered by man, the soil supplies a very restricted quantity of food; certain plants are edible, but their nutritive and calorific value is as a rule very low. Moreover, the density of plants which can be utilised is quite insufficient to supply nourishment for large groups of human beings living in a settlement.

Before primitive man commenced farming he was probably compelled to live in families or in nomad groups moving constantly hither and thither over large areas in search of food.

The first and most important transformation in natural living conditions would appear to have been the *artificial cultivation of plants*. Through cultivation certain species of plants came to predominate; after selecting those which he considered useful or which he liked, man set about multiplying and tending them, while he destroyed those which he considered useless in order to free the ground he wished to reserve exclusively for the selected species.

Something similar took place in the animal kingdom, *certain species of animals* being domesticated until they became useful to man by supplying him with food and clothing, and by working for him.

The second important transformation in human life was due to the discovery of *fire*, with the result that it became customary to cook food. Certain of our principal articles of diet are more easily assimilated when cooked; one of these is rice, which forms the diet of between seven and eight hundred million inhabitants of Asia and Africa; another is wheat which is more assimilable in the form of bread; cooking also improves the taste of food and of meat in particular; lastly, by destroying the pathogenic parasites which may be found in solid and liquid food, it prevents serious disease.

The influence of agriculture and of the discovery of fire on the existence of man was completed by the invention of many technical processes altering the nature and uses of primitive foods. Among these processes, one of the most important discoveries was the *art of preserving food*.

Primitive man doubtless paid little attention to preserving his food; in the course of his constant struggle to maintain a meagre existence, he gathered plants and killed his game wherever he found them. As soon as life became less simple it became necessary to think for the morrow, and food had to be preserved by drying, smoking or salting. But the industry of food preservation has only been perfected during the past hundred years or so by means of sterilisation in closed jars. APPERT was the first to use this method, which has led to the establishment of the extremely important industry for the preservation of animal and vegetable products. During the Napoleonic period preservation of food for long periods and its transportation presented an exceedingly serious problem. It is curious to note that war, by creating difficulties in regard to nutrition, often leads to the discovery of new methods of transformation which are later used as the point of departure for new trends in times of peace.

While the use of preserved foodstuffs led to certain changes in human diet, it should also be observed that increased speed in *means of transport* (ships, railways, aeroplanes), has also had marked effect. Now that the most perishable foodstuffs can be carried rapidly in their fresh state from one country to another and even from one continent to another, man, especially if he lives in an important centre, is no longer bound by serious seasonal variations in his diet, since he can procure every kind of fruit and vegetable at any season. The *cold storage process* has become as important for the transportation of fresh foodstuffs as the use of heat for the preparation of tinned goods.

The introduction of stimulants (coffee, tea, chocolate), *colonial goods* and spices to continents where they are not produced, has led moreover to extensive consumption of these foods, although they are not prime necessities.

Man's diet has undergone incessant *changes* through the centuries as regards preparation and consumption of foodstuffs. This evolution is often marked by improvements which have, however, sometimes led to unexpected results. Modern processes for the preparation of foodstuffs eliminate the nutritive substances needful to life and they must therefore be replaced by their equivalents in the human diet.

Exchange of foodstuffs between the continents and from one country to the other generally makes it possible to fill in the gaps, but in war-time this resource is lacking to a greater or less degree and the State then attempts to ensure the minimum of food necessary for the maintenance of health.

Foodstuffs and diet in normal times.

Before describing the kinds and quantities of food required by man, we will first state what is meant by food, what are the various essential nutritive substances and, lastly, in what measure they should be included in the daily diet.

I. — DEFINITION OF FOOD AND CLASSIFICATION OF NUTRITIVE SUBSTANCES.

Oxygen is inhaled by the respiratory organs, while food enters through the mouth and passes along the alimentary canal where it undergoes chemical and physico-chemical processes that permit subsequent assimilation.

In his "Chemical Letters" LIEBIG says that every gaseous, liquid or solid substance introduced into the organism to replace the constant losses and to furnish it with the energy required for its normal functions, should be considered as food. In his classification, which is one of the oldest, he distinguishes two types of food: (1) Body building foods (including proteins and mineral salts); (2) energy producing foods (including carbohydrates and fats).

BUNGE, on the other hand, distinguishes three types (1) albuminoids and fats, producing energy and building and replacing the tissues, (2) carbohydrates, substances which only produce energy, (3) water and salts which only serve to reconstitute the tissues.

GUARESCHI distinguishes: (1) inorganic nutritive principles (water, air, salts), (2) organic nutritive principles (a) non-nitrogenous (carbohydrates and fats), (b) nitrogenous (protein and non-protein) (3) Metallo-organic compounds, (a) Iron compounds (haemoglobin, haematogens), (b) Phosphorous compounds (lecithins, phosphatides and phytins), (c) Magnesium compounds (Chlorophyl) and (4) secondary nutritive principles.

According to BECKER, all our foods can be divided into two groups (1) protective foods, containing proteins, which are important from a biological standpoint, mineral salts and vitamins; (2) the so-called energetic foods, which only supply the organism with what might be called fuel.

Lastly there is the classification of nutritive principles according to their calorific value and based on the energy equation; foodstuffs contain a potential chemical energy which is transformed, by digestion and absorption, into thermic energy, *i. e.*, heat.

In calculating the value in calories of a given diet, it must be remembered that our organism does not use all the potential energy supplied by the substances ingested. A part is lost in the excrements, while the fats and carbohydrates are more completely consumed than the proteins. The calorific value is calculated by assuming that the number of calories supplied is as follows: carbohydrates: 4 calories per gramme; fats, 9 calories per gramme, proteins, 4 calories per gramme.

2. — PRINCIPAL HUMAN FOODS.

We know that the human organism requires carbohydrates and fats for muscular work. Proteins are necessary for the growth of living tissues and for their maintenance. Certain mineral salts and vitamins are also necessary. All our foods contain one or several of the above elements, but the relation between carbohydrates, fats, proteins, mineral salts and vitamins contained varies from one food to another.

In considering the importance of the various foods in the human diet, it is found that *cereals* take first place, being in one form or another the most common and cheapest food. Wheat, rice, rye, maize, barley and oats supply one third and perhaps more of the calories absorbed from food. Rice is the most widely consumed cereal, being the principle article of diet of a good half of the world's population. Next comes wheat, which is of predominating importance in America and western Europe.

From the standpoint of nutritive value, there are of course differences between the various species and varieties of cereals, but still more marked differences are to be found in the several parts of a single grain, the composition varying in its three principal parts the outer tegument contains a high percentage of mineral matter and vitamins, the embryo or germ, which in weight represents only a very small part of the ear, contains an abundance of protein, vitamins and above all of fatty substances, lastly, the endosperm, filled with starchy particles, and which contains the majority of the carbohydrates and a good percentage of protein, but is relatively poor in mineral substances and vitamins.

It will thus be understood why white bread and polished rice are incomplete foods, as valuable elements have been removed in processing. The diet must therefore be completed by incorporating other substances to replace the elements which have been removed.

The maximum proportion of cereals to the remainder of the diet is also very variable. Four-fifths of the necessary calories in the diet of large groups of the inhabitants of the Orient are obtained from rice and small quantities of other cereals, the remainder being obtained from vegetables. On the basis of the American diet, ROSE observes that if more than one third of the calories is to be furnished by cereals, the whole grain must be eaten, including the tegument and the germ. Other studies show that when the diet is based mainly on cereals, at least one-fifth of the food consumed must consist of milk in the first place and then of green vegetables and fruit.

With the exception of molasses and sugar-cane syrup, which contain a high proportion of mineral substances obtained from the sap of the plants, *sugars* in general and their syrups supply only carbohydrates to the human diet. It is interesting to observe that in the United States one quarter of the necessary energy is at present supplied by sweet foods. This diet leads to a corresponding reduction in the amount of proteins, phosphorus, calcium, iron and vitamins consumed. Recent research also shows that a high proportion of sugar is not advisable and that it would be preferable to replace at least some of this food with fruit.

The important part played by raw *milk* in nature is an indication that it is difficult, if not impossible, to find a satisfactory substitute. Milk supplies a type of protein particularly favourable to growth and the maintenance of the tissues. Milk proteins provide the important amino-acids which are lacking in cereal proteins. It also contains lactose, a carbohydrate which favours the growth of lactic ferments (*Lactobacillus acidophilus*) in the intestine. The fatty substances contained in milk, being in a state of emulsion, are easily absorbed; this is valuable in itself, but chiefly because it also supplies *fat soluble* vitamins and vitamin A in particular. Certain diets, adopted chiefly in America, obtain at least one half of the calcium necessary to the organism from milk. The consumption of milk is rendered all the more advisable since calcium is one of the elements which is most commonly lacking in ordinary diets. Milk also contains all the known vitamins, very few other foods containing them in such high proportions. Beside vitamin A, it contains B., B₁, D and E and, if the milk is suitably treated, vitamin C as well.

Eggs are an excellent source of energy and stimulate growth. They are rich in protein, fats, phosphorous compounds, iron and vitamins A and D; all these elements are present in the form best suited to the formation of living tissues. The nutritive matter is not distributed uniformly throughout the egg but is more concentrated in the yolk, the white containing nothing but protein and water. SHERMAN asserts that in order to obtain a good diet at least 4 eggs or 4 yolks should be eaten weekly. From the nutritive point of view eggs are more than a substitute for meat and should rather be considered as a complement to it.

Meat, poultry and fish have much the same value, containing proteins for the most part which, like those contained in milk and eggs, have a high nutritive value as well as very variable quantities of fats. Like cereals, these types of food are rich in phosphorus and iron, but poor in calcium. Thus, by introducing ordinary meat or poultry and fish into a diet based mainly on cereals, although some of the amino-acids lacking in cereal proteins would be provided, line calcium would still be lacking.

Animal glands are as a rule relatively richer in iron, phosphorus, copper and manganese than the muscles, but their calcium content is poor. Sea fish, particularly shellfish, are an important source of iodine but when this element is deficient, iodised salts may be used as well. Muscular tissues cannot be considered as an important source of vitamins, except of vitamin B₁. Glands of land animals and certain shellfish, which are on the other hand, contain large quantities of vitamins A and B. Esquimaux, for instance, live mostly on a meat diet and have a preference for glands, considering them as a titbit and often eating them raw. They also utilise the blood, the tenderer bones, marrow and the stomach of animals in the raw state. Most peoples who adopt a more varied meat diet do not eat these organs, however, and consequently a part of the nutritive substances of meat is not used. From the scientific standpoint it is not easy to define the place that meat, poultry and fish should take in the diet; they have the disadvantage of encouraging intestinal putrefaction. The most serious obstacle to an increase in the consumption of meat is its price, as this is the most expensive of the essential foods. SHERMAN observes that, while outlay for the purchase of meat

increases, that for the purchase of eggs, milk and cereals shows only a slight decrease, whilst the outlay for fruit and fats decreases considerably. In other words, as the importance given to meat in the diet and the food budget increases, the diet becomes poorer in calcium and vitamins A and C, and even in vitamin B. Butter and fruit tend to compete with meat in the present day diet much more than other foods with a high protein content. SHERMAN also states that at least as much money should be spent on dairy products on the one hand and on fruit and vegetables on the other, as on meat.

The *fruit and vegetable group* is of the greatest importance, as these foods provide the necessary minerals and vitamins. Vegetables in general and green vegetables in particular are an excellent source of calcium; the latter also supply large quantities of iron. Fruit, although not so rich in minerals as vegetables, nevertheless supplies them in sufficient quantities if eaten in abundance. With some rare exceptions, vegetables and fruit also help to maintain the organism's alkaline reserves and as a rule they have a slightly laxative effect. They vary greatly in their vitamin content: green and yellow vegetables are especially rich in vitamin A; vegetables and fruit in general supply an abundance of vitamins B₁ and B₂; citrus fruits, tomatoes, cabbage and onions, if eaten raw, are the richest in vitamin C, while other fruits and vegetables, such as apples, bananas and potatoes, also contain considerable quantities of this vitamin.

A more general consumption of fruit and vegetables is advisable for many reasons, but it should be recalled that certain factors tend to decrease the vitamin content; one of these is the manner of cooking. If the water in which a vegetable has been boiled is thrown away, for instance, a part of the vitamins and the minerals dissolved in the cooking process is lost. Moreover, the action of heat and oxydization causes serious loss, especially of vitamin C. Consequently it is advisable, whenever possible, to eat fruit and vegetables in the raw state. In certain countries unfortunately, the poorer families are unable to include as much fruit and vegetables in their diet as they ought, owing to their high price.

On the basis of recent knowledge SHERMAN gives the following summarised advice concerning the choice of daily food:

(1) Obtain at least half of your necessary calories from protective foods, such as milk and its derivatives, fruit, vegetables and eggs;

(2) Whatever type of bread, cereal or cereal product you eat, at least one half should be in the form of wholemeal or dark bread.

Speaking of costs, he says:

(1) Spend at least as much for milk (including cream and cheese) as you do for ordinary meat, poultry and fish;

(2) Spend at least as much for fruit and vegetables as for ordinary meat, poultry and fish.

3. — DIET.

According to Bottazzi "a good diet is that which makes it possible to give the organism the greatest well-being and the greatest amount of strength by consuming a minimum quantity of foodstuffs and consequently reducing the work

involved in metabolism to the least possible amount". This general definition covers the whole question indirectly.

It should not be forgotten that one single food rarely contains all the substances necessary for a complete human diet and only by a judicious combination of several foods is it possible to satisfy the requirements of the body. In other words, if the nutritive substances are to give their maximum output from several points of view, they must be supplied in proportions ensuring a well-balanced diet

INDIVIDUAL DIET.

It is very difficult to make an exact estimate of the quantities of protein, fat and carbohydrates required by each individual. Writers are not agreed on this point. Here are some figures: VOIT suggests that an average worker requires 118 gr. of protein, 56 gr. of fat and 500 gr. of carbohydrates daily; RUBNER gives the following quantities 80 gr. of protein, 133 gr. of fat and 300 gr. of carbohydrates; SCHWEIGART's figures are 93 gr. of protein, 115 gr. of fat and 404 gr. of carbohydrates.

In a certain sense and to a certain degree it may be admitted that proteins, fats and carbohydrates can replace each other as regards their heat-producing value, thus 100 calories can be obtained from about 25 gr. of protein, from 25 gr. of starch or from 11 gr. of fat. This is RUBNER's law, called the law of isodynamism.

In reality, a mixed diet is always preferable, as the organism has absolute need of these three constituents.

The daily requirement of minerals and vitamins cannot be measured in the same way as the other food principles; approximate quantities have, however, been fixed for certain of these factors. The following figures may be given for minerals. Calcium STIEBLING and WARD consider 45 gr. as a minimum, 68 gr. as a normal quantity and three times the minimum as an optimum quantity (Sherman). STIEBLING and WARD consider the average requirement of phosphorus to be 1.32 gr., of iron 0.015 gr. and of iodine 0.050 gr.

For the sake of unifying calculations concerning vitamins, these are expressed in international units. Thus we have vitamin A minimum, 2000 international units (American Public Health Association Year-Book 1934-35), normal, 4000 international units, optimum, 8000 international units. Vitamins B₁ and B₂: 225 international units are considered as sufficient. Vitamin C. 300 international units, corresponding to 015 gr. of antiscorbutic acid are considered as sufficient and 1080-1260 as optimum. Vitamin D: approximately 300 international units are considered as sufficient (*League of Nations' The nutrition problem*. Vol. II, 1936).

These figures are of course subject to alterations and wide differences may be observed in the data supplied by the various authors.

DIET OF THE VARIOUS NATIONS.

The quantity of nutritive elements required by the different peoples varies according to several factors such as the geographic position of the country, climate, sea and land products, race and traditional customs and, of course, the differ-

ences between one nation and another are great. Mention need only be made of the Esquimaux, whose diet is based on fish and whale fats, the Far-Eastern peoples, who live principally on rice and the inhabitants of Europe and America who live on a mixed vegetable and meat diet. Man is omnivorous and eats a large variety of foods in the various regions of the world, but whatever this variety may be, approximately the same quantity and the same type of main foods are found (proteins, fats, carbohydrates, vitamins and mineral salts); taken as a whole, the same quantity of calories is found in the daily diet of individuals living under normal conditions in similar climates.

The following data given for Germany in 1936 by SCHWEIGART give an idea of the sources of the three first groups of nutritive substances (proteins, fats and carbohydrates) and of their distribution throughout the nation:

(1) most of the proteins are supplied by wheat (34 per cent.); meat comes next ($23\frac{1}{3}$ per cent.), then milk (21 per cent.) and lastly potatoes, fruits, vegetables, tropical fruits, fish and eggs, representing, a total of 21 per cent.

(2) the principal source of fats is in meat and meat products (41 per cent.), followed by milk and its derivatives (29 per cent.), whale and vegetable fats (19 per cent.), wheat, tropical fruits, eggs, fish and potatoes with only 11 per cent.

(3) about half of the carbohydrates come from wheat (48 per cent.), followed by potatoes (20 per cent.), sugar ($16\frac{1}{2}$ per cent.), fruit, vegetables and tropical produce ($7\frac{1}{2}$ per cent.), milk and its derivatives ($5\frac{1}{2}$ per cent.) and other unspecified groups (3 per cent.).

According to this author, the diet of the German people consists of 15 per cent. protein, 20 per cent. fat and 65 per cent. carbohydrates. The following annual quantities are indicated for each individual for 1936 34 kg. protein, 42 kg. fat and 148 kg. carbohydrates, these figures corresponding to a daily ration of 93 gr. protein, 115 gr. fat and 404 gr. carbohydrates. The total quantity calculated for the whole German nation in 1936 was therefore 2,290,000 metric tons of protein, 2,850,000 metric tons of fat and 9,970,000 metric tons of carbohydrates.

He makes no special mention of vitamins and mineral salts which are of course found in the other three groups of nutritive principles.

Food and diet in war-time.

The adequate freedom of trade in peace-time makes it possible to replace whatever may be lacking in one or other fundamental group of foodstuffs. In war-time the possibilities of each country have to be utilised to the full. Everything is done to avoid waste, to recover all that is possible and to make a fair distribution of available resources. While in peace-time everyone is free to feed as he pleases and according to his means, in war-time this becomes impossible. Governments have, therefore, to undertake the business of ensuring that each person has a fixed minimum of food determined on a scientific basis.

In order to guarantee this minimum when production is inadequate, new sources of supply must be found and all waste must be avoided by means of rationing. The next objective is to increase production and where this is impos-

sible, synthetic products must be found to replace foods which of which there is a shortage.

From an examination of the various groups of nutritive principles the problems to be faced are found to be as follows:

I. — CARBOHYDRATES.

The minimum quantity of carbohydrates necessary for a daily ration is subject to severe fluctuations, these substances being the main source of energy. The minimum is about 300-400 gr. daily.

As a rule these products are of vegetable origin and very few are obtained, like lactose, from the animal kingdom.

The question of carbohydrates is, above all, a matter of *cereal production* (bread), tubers (potatoes) and sugar-bearing plants, vegetables, fruit, etc.

All nations are not in a position to fill the requirements of their inhabitants in this respect. Intensive manuring will, of course, make it possible to increase yields per hectare and nitrogenous, phosphatic and potash fertilisers, if judiciously applied, will lead to record yields. In most countries there is a *bread problem*, as there are certain difficulties the production of white bread prepared entirely with wheat flour. Many countries have already taken measures in this connection: the use of 60-70 per cent. bolted flour has been forbidden replacing this type with more highly bolted flours mixed with other flours (rice, maize, beans, etc.) in varying proportions. In countries where cereal cultivation cannot be extended, potatoes constitute the cheapest form of carbohydrates; recent research has shown that this tuber contains proteins and vitamins as well as starch.

As regards *sugars*, cane and beet sugar are at present indispensable. Countries producing large quantities of fruit can use the juices, as their whole sugar content can be utilised in a very satisfactory form if concentrated while the fruit is fresh.

As regards sources of other carbohydrates for use as food, mention may be made of glucose obtained from wood cellulose (BERGIUS and SCHOLLER processes). Wood contains about 50 per cent. of cellulose which is converted into glucose by heating with mineral acids *and water* at a temperature of about 140° C. It should be mentioned that sugar obtained in this way has a slightly lower food value and sweetening power than beet sugar but failing the latter, wood sugar can be used with safety. As this product is very expensive, the production of sugar from wood by *hydrolysis* has so far proved unpractical.

II. — FATS (LIPIDS).

The chief economic importance of fats consists in supplying the organism with fat-soluble *vitamins*, in maintaining at a fairly constant *level* the fat reserves distributed throughout the organism and, lastly, in supplying heat and energy. Their importance is mainly due to the fact that they act as reserves. The quantity necessary to the organism is from 80 to 100 gr. daily per person the minimum, according to SCHWEIGART, being 65 grs.

Fats are found in both the animal and vegetable products. They are present in the seeds of plants and various fruits and constitute the germ's reserves. In animals they occur in adipose tissue or are found in the cells of certain organ (lymph, secretions and especially in milk).

The output of vegetable fats can be increased by the cultivation of oil seeds such as linseed, the new varieties of the sweet lupin and the soya bean; the seeds of the beech, elm, lime, pine and other trees can also be used. Grape stones contain about 15 per cent. of oil and coffee grounds have also recently been used in Germany for the extraction of oil, giving a yield of some 13 per cent. It also seems that coffee, which has up to the present been cultivated as a drink only, can be used for the production of oil, just as in Greece tobacco seeds are employed for this purpose.

The production of animal fats is closely allied to the dairy industry (which is fundamentally butter production) and to the meat industry. Another very important source of animal fats is found in the fishing industry, whale oil taking first place, followed by oil extracted from herrings, etc. Large quantities of fats can be recovered from waste products and from bones, which give an average oil content varying from 5 to 10 per cent.

As regards the economic aspect, if all animal and vegetable fats were utilised to the full for nutrition purposes, they could be replaced in the industrial field by synthetic fats. Several processes for the production of synthetic fats have been discovered recently, the greatest progress in this field having been made, in the synthetic production of fatty acids. Paraffin hydrocarbons can be transformed into an fatty acids by oxydation. According to FISCHER-TROPSCH, the manufacture of petrol produces paraffin hydrocarbons as a by-product which can be used in this way. It should also be mentioned that the biological synthesis of fats by yeasts and moulds is capable of practical application.

Soap-making is one of the principal industrial fields where natural fats can be replaced by synthetic fats. Since this industry consumes large quantities of fats at the present time, almost exclusively of animal and vegetable origin, large amounts would be released for human consumption if it were possible to effect this substitution.

Soaps consist of the sodium and potassium salts of the fatty acids, principally oleic, stearic and palmitic acids. These should be able to be produced instead by oxidising liquid straight chain hydrocarbons by air, the sodium salts obtained in this manner forming a good alternative method for the manufacture of soap. Large quantities of such soap are now produced in Germany and it is quite possible that after the war this new product will continue to replace soap made from natural fats.

III. — PROTEINS.

In order to establish the quantity of proteins required for human consumption, the following points must be borne in mind: (1) the (endogenous) minimum of protein, (2) the minimum to maintain the tissues (physiological minimum) and (3) the minimum for the maintenance in activity and health (VON FÜRTH).

The endogenous minimum (which does not suffice to preserve the nitrogen balance), amounts to between 17 and 25 gr of proteins, of course other substances must be added, not necessarily proteins but having an adequate calorific value.

The physiological minimum is the quantity of protein which, when added to a diet rich in calories, is sufficient to ensure the nitrogen balance; this minimum is higher than the endogenous minimum and runs from 45 to 60 gr.

The third figure is the quantity of protein required by a normal healthy man when performing a moderate amount of work, to allow him to continue performing the work and maintain his health; this minimum varies from 75 to 95 gr.

It should, however, be observed that these minimum values are affected by a number of factors dependent on the quantity of calories supplied by the diet, the amount of work accomplished, the protein value and the relative carbohydrate content of the diet, the content of fat in the body, the mineral substances supplied by the diet, the acid-base balance, etc. As a rule when speaking of an adequate minimum of protein substance, this minimum of protein is meant.

According to physiologists, the quantity of protein required by man is as follows, the values indicated varying from one country to another from 89 to 135 gr (MEMMO, NICEFORO, GALEOTTI), with an average of 100 gr for the rural population in Italy (QUAGLIARELLI), from 60 to 145 gr in England (CATHCAR, WIDDOWSON, HAMILL and SHRYVER, MELVILLE); from 66 to 118 gr for Germany (VOIT, NEUMANN, GIGON, KRAUT, HEUPKE) (the desirable quantity in this country is considered to be 80 gr of protein with 2,500-3,000 calories, the minimum being 60 gr of protein with 2,700 calories); from 94 to 149 gr for Denmark (HEIBERG), from 67 to 175 gr for America (ATWATER, BENEDICT, PEARL, STIEBELING and WARD), from 71 to 91 for China (WU, ADOLPH), 73 to 80 gr. for Japan (KUMIGAWA, MATASUMI and SASAKI). The average required by the population of the world as a whole is estimated as being from 81 to 90 gr. per head by COHNHEIM, from 79 to 90 gr. by RUBNER and 100 gr. by TYSKA.

The following table shows the quantities of proteins (fats and carbohydrates) consumed by the troops of some of the belligerent countries during the Great War (MEMMO)

	Proteins	Fats	Carbohydrates	Total calories
	gr	gr.	gr	
English troops (May, 1918)	124	136	419	3 483
Canadian troops (July, 1918) . . .	107	118	344	2 946
French troops (March, 1918) . . .	138	98	467	3 604
Italian troops (February, 1917) . .	127	38	469	2 797
American troops (in garrison) . . .	147	174	243	4 850
American troops (in the field) . .	129	136	545	3 998

The various authors are far from agreeing as to the minimum daily amount of proteins necessary: VOIT mentions 118 gr for a man of average weight per-

forming ordinary work; ATWATER estimates that 125 gr are required under the same conditions; CHITTENDEN and HINDHEDE, on the other hand, consider about 50 gr as sufficient. There is now a tendency to consider that a daily ration of between 80 and 100 gr of protein of a high physiological value is sufficient. Consequently, the quality of the protein is of extreme importance in diet.

Of course, the organism uses only a part of the proteins contained in the food consumed, as they are not entirely assimilated. This is why it is impossible to indicate a single figure as representing the quantity required daily, since various proteins are not digestible to the same degree and, moreover, digestibility can be increased by cooking and decreased by dessiccation.

Again, depending on its source, the digestible part of protein food is utilised to a different extent by the organism. This brings us to the question of the "biological value" of the various proteins (THOMAS).

According to Thomas's system, numerical values of this property are assigned to different proteins. The protein matter of milk and of beef is reckoned to have a value of 100 (ca); fish proteins then have a value of 90 and casein 70-80 whilst vegetable proteins have, in general, much lower values. The biological value of pea proteins, for instance, is 56, of wheat between 44 and 50, of rye 44, of French beans 25 to 38. Those vegetable proteins which are more similar to animal proteins have a higher value: oats 75, barley 60-80 and potatoes 84 (MANGOLD).

It is also known that the difference in biological value between the various proteins is due to the amino-acids contained, these acids include tyrosine, cystine, tryptophane and also leucine and phenylalanine, and they play a valuable part in replacing and renewing the proteins in the organism, while glycine, which is found in many proteins, has a slightly lower value and can be produced by the organism itself.

Proteins originate in both the animal and vegetable kingdoms. Consequently countries with large number of livestock and a flourishing dairy industry need have no anxiety concerning the supply of animal proteins which have such a physiological importance. Countries bordering on the sea are also in a favourable position due to the abundant supply of fish, sea-fish provide food with a high biological value and are very important in counterbalancing a shortage of meat.

Vegetable proteins are those contained in cereals (wheat, oats, rice) and other plants (peas, French beans, broad beans, soya, etc.), but since their protein content is much lower, vegetable products have not the same value as animal products.

The "Edelsoya" is, however, a remarkable exception to this rule; one kilogram of its flour contains 415 gr. of protein, 202 gr. of fat and gives 4,606 calories, while one kilogram of meat gives 200 gr. of protein, 35 gr. of fat and 1200 calories. In view of its high protein and fat content, the "edelsoya" is therefore greatly superior to meat, although the latter is preferable because its proteins are much more digestible.

Vegetable and animal proteins can if necessary replace each other, but it is always preferable to use both in order to maintain a rational diet.

Owing to the high biological value of the milk protein, as far as possible one tries to use the greatest possible part of it; it is for this reason that lacto-albumin, prepared from skimmed milk, is incorporated with macheroni and oat flakes, cocoa etc. to give these a better feeding value.

It may happen that there is a shortage of protein supplies in war-time leading to problems which are difficult of solution. Two remedies have so far been found: (1) the production of synthetic protein from yeast; (2) the production of a larger quantity of proteins by increasing stockbreeding and fattening the animals on optimum fodder.

In one sense synthetic protein obtained from yeast may be a stage in the production of animal protein; since yeast provides an excellent concentrated feeding stuff for cattle. The actual method adopted will depend upon the materials available; if sugar is abundant, for instance, it may be used in this way for the preparation of a protein. Successful experiments in recent years in connection with the production of sugars from wood have produced such large quantities of simple carbohydrates that the problem could be solved by using this sugar for producing proteins with yeast.

IV. — MINERAL SUBSTANCES.

Mineral substances are generally found in sufficient quantities in various foods. They are also absorbed by the organism from various drinks: mineral waters, must, cider, wine, beer and drinking water, not to speak of milk, whose mineral content consists mostly of *calcium*, present in a highly assimilable form. It is often difficult to obtain calcium in sufficient quantities; since it plays a very important part in the formation of the bones and teeth, milk, and also green vegetables, are extremely important in this connection for children and adults. Preserved fish also contains calcium in a highly assimilable form.

In China, where milk is not produced, the population consumes bones, cooked in vinegar in order to obtain the necessary calcium. In other countries where milk is also lacking, the ashes of certain plants rich in calcium are given to pregnant women and nursing mothers.

Phosphorus, which is closely allied to calcium in the formation of bones, is also found in milk and above all in cheese, liver, oysters, in the flesh of fish and in the yolks of eggs. The principal vegetable products in which this mineral is found are walnuts, hazel nuts and almonds, whole cereals and dried vegetables. *Magnesium* is generally found in the same foods as phosphorus. *Potassium* is usually found in vegetable products.

A very important problem in war-time is that of *sodium* and *chlorine* in the form of common salt, which is used everywhere but is not always produced in the consumer country; of course all sea products, oysters especially, contain these two elements, they are also found in blood, milk and its derivatives, eggs and vegetables, etc.

Although *iron* is present in the body in infinitesimal quantities, its compounds are essential to growth and nutrition (iron containing protein in hemoglobin). Large quantities are found naturally in certain mineral waters, but as a

rule they are introduced into the organism in food. Although the quantities found in milk and its derivatives are small, their effect on nutrition is adequate. Blood, meat, oysters, fish, eggs, green vegetables, the various varieties of endive, cultivated chicory, spinach, turnip tops, raisins, figs, walnuts, plums, whole cereals, etc., all contain iron. The human diet should contain a minimum of 15 mgr. of iron daily.

Iodine, which is contained in infinitesimal quantities in the organism, is nevertheless an essential element in thyroxine, a characteristic product of the thyroid gland, which exercises a decisive influence on metabolism throughout life. It can be absorbed in the form of iodide contained in drinking water and in common salt, which provide sufficient quantities. In America, 50 mgr. of iodine are considered as sufficient in the human diet. Sea fish, salmon, oysters, tunny fish, etc., are excellent sources of iodine.

It is estimated that the daily diet should provide the organism with an average quantity of 21.6 gr. (from 20.0 to 40 gr.) of mineral substances.

V. — VITAMINS.

There is no doubt that fruit and vegetables are the most important sources of vitamins. They contain large quantities of those belonging to the B and E groups, some of them are rich in vitamin A, in provitamin, carotene and above all in vitamin C. Vitamins A and D are mostly supplied by animal food.

The characteristic of vitamins is that each one has a special effect on the organism and that consequently they cannot replace each other. Thus the absence of any one of the vitamins may lead to the typical deficiency diseases.

Vitamin A.

Vitamin A is often referred to as the "antixerophthalmic factor". It is found principally in green and yellow vegetables, butter and the flesh of fish. SCHEUNERT considers that 100 gr. of green vegetables are more than sufficient to provide the daily ration of vitamin A. The vitaminic action of vegetables is due to their high carotene content, which is particularly high in carrots and apcots. The tomato and the pineapple also contain carotene in smaller quantities and traces are found in maize. Herbivorous animals undoubtedly obtain Vitamin A from the carotene absorbed from their food. In this connection it is known that the vitamin content of fodder has an important effect on animal products, and green fodder increases the vitamin A content of milk and butter, and in a less clearly defined manner the vitamin B, C and D contents also. The use of silage is thus able to increase the Vitamin A content of butter, a fact that is of particular importance in northern countries.

Vitamin A is also found in butcher meat, in liver, blood, kidneys etc. But the principal source for the preparation of vitamin A is the oil obtained from the liver of certain fish (*Pleuronectes Hippoglossus*, *Scombrex saurus*, *Rhombus maximus*, *Stereolepis Ishinagi*). It has recently been found possible to manufacture this vitamin synthetically.

The Vitamin B group.

(1) Vitamin B₁ is a substance which protects the organism from the effects of "beri-beri"; its absence leads to nervous diseases, paralysis, etc. Small quantities are contained in cereals, vegetables and potatoes. Thus the question of vitamin B₁ is closely connected with the bread question; brown and "whole meal" bread are the best for supplying this vitamin and mineral substances. Vitamin B₁ is also found in abundance in yeast which is an excellent remedy for "beri-beri"; dried yeast taken directly supplies vitamins B₁ and B₂.

(2) Vitamin B₂ (or G) is also described as a "water-soluble growth factor". Yeast, as mentioned above, contains large quantities of this vitamin.

It has been observed that this substance is identical with the yellow colouring matter, lactoflavine, which is very common in both animal and vegetable products, either free, as in milk or in the form of the flavine enzyme. Flavine is more or less abundant in animal products: maximum values are found in beef liver and kidneys, in the suprarenal glands, the *corpus luteum* and the brain. Many micro-organisms also contain flavine, such as the lactic acid bacteria (*Bacterium Delbrückii*), the butyric acid bacteria (*Clostridium butyricum*) and in top and bottom yeasts.

Vitamin C.

The high antiscorbutic value of vitamin C is due to the presence of ascorbic acid, which is a natural substance contained in vegetable and animal products. The fruit of the *Capsicum annuum* is very rich in vitamin C, as also the leaves of the *Iris germanica*, orange and lemon juice, etc. Vegetables also contain this vitamin, especially when fresh when they are scarce in winter, potatoes eaten in sufficient quantities provide Vitamin C. The value of the potato in this respect is proved by the fact that scurvy has practically disappeared from Europe since the introduction of this tuber, although before the XVIII century it was a very common disease.

When preserves are used to replace fresh fruit and vegetables, it is suggested that natural concentrates of Vitamins A and C should be added to increase their value if they contain only small quantities. This can be done in the case of vitamin C by adding strawberries, black currants and medlars to fruits and ground pimento (paprika) to vegetables.

Vitamin D.

Vitamin D is well-known as a remedy for rickets and osteomalacia, and is especially active in stimulating the assimilation of calcium. It is found in abundance in cod liver oil as well as in the oils extracted from the liver of tunny and other fish, in butter (which contains 20 times less than cod liver oil), meat, eggs, vegetables and mushrooms. The presence of vitamin D in butter is due less to the fodder than to the fact that the ultraviolet rays affect the cow when in the open air and consequently milk and butter contain larger quantities of this vitamin during the period when the cows are out at grass. The content can, however, be increased artificially by adding foods containing this

vitamin to the fodder; the content is tripled, for instance, by including cacao bark which has been dried in the sun.

Vitamin D can also be obtained by exposing ergosterol prepared from yeast to the action of ultra-violet rays.

Vitamin E.

Vitamin E, or fertility factor, is extracted from the oil of germinating cereals; it has recently been prepared in the pure state. The crystallized product is called tocoferol. From the physiological standpoint, vegetables usually contain sufficient quantities of this vitamin.

E. GASSER.

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SYNTHETIC RUBBER AND ITS COMPETITION WITH THE NATURAL PRODUCT *

Analysis of Rubber.

The first analyses of natural rubber were made by the German chemist HIMLY and the English chemist WILLIAMS round about the year 1860. Both discovered and isolated a substance that boiled at low temperatures and the latter assigned it the name isoprene. Analysis showed it to have the formula C_5H_8 , and WILLIAMS noticed that under the influence of the oxygen of the air isoprene underwent a transformation and became thick and viscous.

In 1879 BOUCHARDAT, a Frenchman, voiced the opinion that isoprene should be considered as the parent substance of rubber because in both isoprene and rubber, carbon and hydrogen are present in the ratio corresponding to the formula C_5H_8 , though the rubber molecule was considerably bigger and is still one of the heaviest molecules known, having a molecular weight of about 100,000. The idea of BOUCHARDAT was supported by the fact that terpene, with a formula $(C_5H_8)_n$, is often found in plants, and the formula is in accordance with the analysis of rubber. Further we now know that isoprene is, in fact, after glucose, one of the most recurrent substances which take part in the formation of plant tissue and is also a constituent of Vitamin A., of the yellow pigment Carotin and of the growth hormone Auxin. TILDEN worked on the synthesis of rubber and established the formula of isoprene, $CH_2: C(CH_3): CH_2$, which is accepted at the present time.

According to this formula isoprene belongs to the group of unsaturated hydrocarbons and TILDEN and others confirmed the discovery of BOUCHARDAT that isoprene, if left for several years in a glass vessel, changed to a rubber-like mass. Dr. WALLACH in 1887 described this reaction as follows. "When isoprene is placed in sealed tubes and exposed to the action of light for a long time, a product is formed which, when heated with alcohol, forms a tough mass resembling rubber. This material becomes more or less hard on exposure to air". In this

(*) This article is a part of the monograph "Rubber, 1935-1939", now in preparation

way the polymerization of isoprene to rubber was demonstrated although only in minute quantities. (The word "polymerization" is derived from the Greek words "poly" - "many" and "meros" - "part", and thus means that many molecules of isoprene combine to form one rubber molecule).

Isoprene or 2-methyl butadiene with the formula C_5H_8 , dimethyl butadiene with the formula C_6H_{10} and butadiene with the formula C_4H_6 form a group of closely related hydrocarbons, the so-called dienes, which very easily change into other compounds and which may be considered as being derived from butadiene.

Synthesis of Rubber.

To prepare rubber synthetically, it was thus necessary to have an adequate supply of one of these three substances. Before 1910 all manner of different methods of obtaining the dienes in a pure condition were investigated, for purity seemed necessary to eliminate the doubtful influence of impurities in this very complicated reaction. Before the Great War these attempts came up against considerable difficulties, for isoprene was a rare substance and, even now, it is not manufactured in large quantities; for this reason, artificial rubber is nowhere made from isoprene. However, already in 1910, the polymerization of dimethyl butadiene to methyl rubber was successfully worked and tyres were even made from this material.

Methyl Rubber.

After many attempts to synthesize rubber by other methods and under the pressure of war conditions in Germany, the preparation of methyl rubber was taken up in that country about 1917. This rubber answered at least one requirement, it could be used for the manufacture of ebonite of a quality superior even to that of the ebonite made from natural rubber because the original raw material was purer and, above all, did not contain the proteins that are present in natural rubber. For the manufacture of tyres this Methyl rubber W., as it was then called, was not suitable; this was due to its not having the necessary elasticity in spite of the addition of elasticators and because it acquires a leathery consistency, especially in cold weather. After the war, the manufacture of synthetic rubber was abandoned for this reason.

HOFMANN and COUTELLE, the best known figures in the realm of synthetic rubber, had, however, realized the possibility of polymerizing butadiene, which is the simplest of this series of hydrocarbons, in the same way; this possibility was further investigated and for the last ten years this rubber has been the centre of interest.

The synthetic rubbers hitherto described have been built up by analogy with natural rubber and are the so-called normal synthetic rubbers. Although these products in recent years have not been of much practical importance, this position may change suddenly at any moment for the American product "Neoprene" is made from chlorbutadiene and belongs to the series of normal synthetic rubbers".

Buna Rubber.

In contrast with these normal rubbers those prepared by polymerization under the influence of sodium are considered abnormal. The very important polymerization reaction of the dienes in the presence of finely divided sodium (wire or powder) was simultaneously discovered in Germany and in England in 1910. In this process the sodium wire is allowed to work its way to the surface of the diene polymerizate and then, either by solution or mechanical means, has to be removed. The behaviour of these rubbers in relation to ozone, according to HARRIES' method, is different from that of the former sorts and also from that of natural rubber and, for this reason, they are called abnormal.

The Buna rubbers designated by numbers belong to the group of sodium polymerized rubbers, e. g., Buna 85, 115, and 120, the name itself being derived from the initial letters of "butadiene" and the chemical symbol for sodium "Na". The numbers indicate the length of the carbon chain in the polymerized molecule.

Rubber from Alcohol in the U. S. S. R.

In Russia also similar rubbers are prepared by the same polymerization reaction. Here alcohol vapour is passed over a catalyst at 400° to 450° C. and decomposes, liberating hydrogen and steam, the butadiene that remains is distilled off and fractionated, the utilizable fraction is about 25 per cent. by weight of the original alcohol (LEBEDIEW's method). This fraction is liquified under pressure and converted to rubber by the action of sodium. The process is an expensive one for, for the preparation of 1 ton of buna rubber, 5.2 tons of 90 per cent. alcohol are required. For 1937, the projected production of the so-called S. K. B. rubber was 70,000 tons and for this 330,000 hectares of potato fields were required to produce the necessary alcohol.

In Russia this rubber is used for the manufacture of tyres which are said to be satisfactory, the elasticity is about the same as natural rubber, but the tensile strength is less. In Germany, the numbered buna rubbers are used more in the manufacture of cables and for hard rubber, for the manufacture of tyres there are other rubber varieties produced that are more suitable for this purpose; these are the "lettered" bunas and in particular "Buna S".

The "lettered" bunas.

HOFMANN discovered quite early that mixtures of dienes could be used for the preparation of mixed rubbers; to achieve this in practice use had to be made of several discoveries. The mastication of buna rubber is accomplished by the admixture of polymerizable, though not entirely dienic, compounds. Such substances as, for example, styrene, an unsaturated hydrocarbon, can also be polymerized in admixture with butadiene in the ratio of 25:130 or 50:100. The Buna S which is so prepared is a mixed polymerizate of styrene and butadiene; it is not prepared by the action of sodium, but is polymerized in emulsion in an aqueous solution of surface-active and viscous substances such as soap.

This polymerization in emulsion is brought about by the addition of a small quantity of active, oxydizing agents and the process is found to be susceptible to very exact adjustment in its many variations and thus the "letter" bunas are fairly easily and quickly produced. For convenience, this series of rubbers has retained the name "buna" though they are neither pure butadiene polymerizates, nor are they prepared by the action of sodium.

An improvement in comparison with natural rubber was found because the vulcanized products prepared from the new material by the addition of lamp-black were superior to those prepared from natural rubber. Although in this manner a non-elastic powdery material is used to "fill" the rubber, the mechanical properties of the rubber are in many ways improved. This improvement is noticeable with buna S and also with buna N (not yet mentioned) to a much greater extent than is the case with natural rubber. In this way it was not only possible, as was originally thought, to prepare certain special rubbers for particular purposes but also to make tyres.

The properties of "letter" Bunas.

Buna N, nowadays called Perbunan, is a mixed polymerizate of butadiene with a nitrogenous substance, acrylonitrile, which is also polymerizable. This substance has a remarkable resistance to oil, its power of retaining gases is also particularly good in comparison with natural rubber. Buna N has also other excellent properties as can be seen from the following table

Physical properties of natural and synthetic rubber filled with lampblack.

	Tensile strength kg/cm ²	Extension at break per cent	Loading at 300 per cent extension kg/cm ²	Shore hardness	Elasticity by oscillation
Rubber	260	600	70	65	50
Buna "N"	300	600	90	70	45
Buna "S"	275	650	80	65	50
Buna 115	200	700	55	60	40
Buna 85	175	600	50	65	30
Methyl-caoutchouc W	125	500	50	Plastic	10

In other properties buna rubber is not inferior to natural rubber; especially is this true as regards aging which does not set in as soon as in natural rubber, for this, reason it is preferred for some waterproofed clothing and materials that are exposed to the air but which must retain their waterproof properties. Buna does not deteriorate as rapidly as rubber and is more resistant to the action of heat and steam, but above all, it is distinguished from natural rubber by its ability to be used in the presence of petrol, mineral oil and grease with little or no change. In this respect it resembles Duprene (Neoprene). Finally, like the older material methyl caoutchouc, it is suitable for the manufacture of ebonite.

Considerable data are thus available concerning the German synthetic rubbers; what we do not know however, is the industrial source of butadiene; probably this is manufactured from acetylene, but it is not known for certain. In any case the original substance is obtained from coal and limestone

Improvements in manufacture.

Lately it has been claimed by German manufacturers of synthetic rubber, as we learn from the reports of the American Consul General in Frankfurt on Main (Rubber letters p. 155), that marked progress has been achieved in effecting improvements in their newly established synthetic (Buna) rubber industry, enabling a lowering of production costs, improved quality of output, better processing qualities, decreased consumption of electrical energy, etc., all tending greatly to improve the industry's outlook in competition with natural rubber.

An outstanding development has been the recent perfecting of a new electric-arc process, enabling the manufacture of synthetic rubber by the conversion to acetylene of waste hydrocarbons produced by synthetic gasoline plants and thus dispensing with the need for carbide as basic raw material. The second large plant for producing synthetic rubber, now building at Huls, in Westphalia, will use the newer process, based upon waste hydrocarbons instead of carbide, the basic material used by the first plant, recently completed in Schkopau.

A primary factor in the high cost of synthetic rubber heretofore has been the large amount of electric power, about 40,000 KWH per metric ton, required for its production. It is reported that, due to technical improvements, it will be possible to reduce considerably the consumption of electric power.

When the manufacture of synthetic rubber was first started, serious difficulties were encountered by tyre manufacturers in processing the new material owing to its brittleness and general unworkableness, and it was predicted that it would be necessary to enlarge the processing capacity of tyre plants fivefold for handling the material. However, changes in composition of the synthetic rubber have completely overcome these initial difficulties and the material can now be processed as easily as natural crude rubber. The final solid Buna rubber is produced, in a similar manner to natural rubber from natural latex, *i. e.*, with the addition of acetic acid.

Buna rubber as formerly manufactured could only be used for the manufacture of tyres of only one life, *i. e.*, the rubber could not be reclaimed. This disadvantage has also been overcome by recent technical progress and it is now possible to reclaim synthetic rubber contained in worn-out tyres.

Most of the tyres incorporating Buna rubber manufactured until now have included about 30 per cent. natural rubber. However, the outer tread has consisted entirely of Buna rubber owing to its greater resistance to wear compared with natural crude rubber. While for some time at least, natural rubber will be included with synthetic in the manufacture of tyres, it is expected that, as commercial output of synthetic rubber expands, tyres will be made up on an increasing scale from synthetic rubber without the addition of natural rubber.

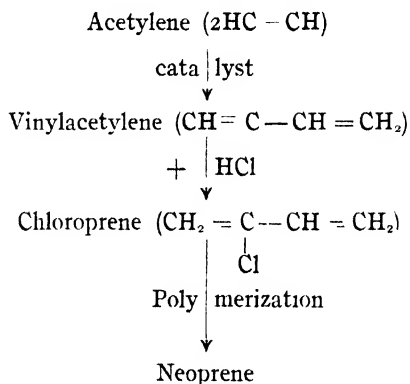
Cost of Production.

The costs of synthetic rubber are still high, being reported as around 3.00 Marks per kg. However, it is expected that further progress will be made, enabling a progressive reduction in cost, and that ultimately the stage will be reached where the synthetic product will be fully competitive with the natural product. It should be pointed out that even the present price difference does not reflect the relative economy of synthetic and natural rubbers since the former is said to be superior, enabling manufacture of automobile tyres of considerably longer life, owing to greater resistance to wear, oils, petrol, etc., compared with tyres of natural rubber.

In order to assist the financing of the new rubber plants, the import of natural crude rubber is taxed 125 marks per 100 kilos of crude rubber imported into Germany, effective from May 13, 1937. From December 1, 1937, the rate was increased to 160 marks and on March 15, 1938, it was further raised to 170 marks. This means an equivalent of over 50 millions American dollars annually at the official rate of exchange.

Neoprene.

The American synthetic rubber, called Neoprene (formerly Duprene), is an invention of the friar NIEUWLAND (1931) and is manufactured by a new and apparently much simpler process than the German synthetic rubber. The course of the synthesis may be ideally represented as follows:



The resulting product is very similar to fully vulcanized rubber. If the polymerization is stopped at an intermediate stage, a material similar to soft uncured rubber is obtained. This "Neoprene" (trade mark), a dark brown substance with a peculiar and penetrating odour, is being sold to rubber manufacturers. Various ingredients are mixed into the neoprene on mixing mills in the same way that rubber is compounded. The mixtures are cured simply by heating, as neoprene has the advantage over rubber in not requiring the addition of sulphur to vulcanize it (WOLF p. 390 ff.).

Price of Neoprene.

Neoprene is manufactured by the E. I. du Pont de Nemours & Co. Inc. Wilmington (Del.) and first marketed at a price of \$ 1.05 per lb. afterwards at \$ 1.00. From April 1, 1936, the price was lowered to 75 cents. At the same time the Du Ponts indicated that they were aiming at 50 cents as the price for the near future, however, in 1939, it is still at the 65 cents level.

Properties and Uses of Neoprene.

Compared with hevea rubber, neoprene is much more resistant to oil, petrol, mineral oil, acids and alkalis. It is more resistant to aging caused by air and light. It is more resistant to penetration by water and it is less permeable to gases such as hydrogen and helium. It can be used to better advantage for most of the purposes that natural rubber serves and for many uses where natural rubber is not satisfactory. Emulsified into synthetic latex it can be used for every purpose to which Hevea milk is put and, for some purposes, it is superior because of its greater ability to penetrate such materials as leather and wood.

Neoprene is finding many other uses in industry. Gaskets, washers, packing, transmission and conveyer belts which operate under oily and greasy conditions are better made of neoprene than of rubber. Printing rollers, blankets for newspaper and lithographic offset printing, and printing plates for use with ink and paint are being made of this laboratory creation. Pump pistons and cups in oil slush pumps, grease gun and paint spray hose, hospital sheeting which must contend with severe disinfecting materials, balloon fabric and diaphragms for gas meters, and gloves and aprons for use in chemical plants are other applications in which synthetic rubber is finding an increasing use.

Another property in which neoprene appears to excel natural rubber is abrasion resistance. It is stated that neoprene tyre treads have been constructed which have wearing qualities about 20 per cent. better than the best rubber treads.

In two respects neoprene compares unfavourably with rubber. It possesses a rather disagreeable odour which makes it unsuitable for personal and domestic articles and the raw product toughens with age. This latter feature seems to raise a number of difficulties since the manufacturers accept no responsibility for neoprene that has been kept on hand for more than 90 days. The bearing of this factor on the marketing and export of the material is obvious.

Consumption of synthetic rubbers.

It would be of great interest to know the present consumption of synthetic rubber. In the official import figures, the imports crude rubber to Germany and the Soviet Union are not published nor are figures relating to production available.

In order to obtain a survey of the 1938 United States consumption of synthetic rubber, manufacturers were asked to report their consumption of "Neo-

prene, Thiokol and Buna". As a result of data received from co-operating consumers and producers, the figures shown below by groups of consuming companies were compiled. Altogether 1,824,375 lb. were consumed during 1938. It is known that certain quantities of Buna rubber were imported into the United States in this year. The table is incomplete in that reports of consumption by numerous small users were not received, yet the total of 168 companies using synthetic rubber in 1938 is impressive. Practically all the companies were engaged in production of some form of mechanical rubber goods; one exception was a rubber glove manufacturer. There is reason to believe that the durability of the goods of which synthetic rubber became a component part (often a small part of the total weight) was on the average increased enough so that the net saving in natural crude rubber was several times greater than the quantity of synthetic rubber consumed.

Number of Firms	Reporting consumption	Synthetic Rubber (lb.)
10	over 50,000 lb.	945,709
13	20,000 to 50,000 lb.	364,016
16	10,000 to 20,000	232,822
24	5,000 to 10,000	177,268
38	1,000 to 5,000	81,557
67	under 1,000 lb.	23,003
		-
		1,824,375

The distribution of consumption among large and small manufacturers is striking and reports from several sources indicate that new applications of synthetic rubber are constantly being developed and popularized (Rubber News Letter, October 15, 1939, p. 198).

The official statistics of United States imports of synthetic rubber give the following figures.

Month	lb	Dollars
January 1939	—	—
February	44,092	33,454
March	2,800	1,552
April	171,087	130,987
	<u>217,979</u>	<u>165,993</u>

It is learned that these figures cover imports from Germany during February and March as well as April. Correction is later made on these figures, the total imports amounting to 339,867 lb., value \$258,912, origin Germany, (\$0.76 per lb.).

Synthetic Rubber in Japan.

Besides in the countries U. S. A., Germany and Russia, the manufacture of synthetic rubber is of some importance in Japan, Poland and Italy.

According to a report released on December 2, 1938, by the Nippon Kogyo Shimbun of Osaka, the Japan (Synthetic) Chemical Industrial Company has decided to establish a synthetic rubber plant on the basis of research work carried out during the past two years. The new plant will concentrate on studies of chloroprene synthetic rubber by use of ethylene gas as the main raw material.

Poland.

The inception of the manufacture of synthetic rubber by the Polish firm "Stomil" in 1938 is a development of some importance. The initial capacity of this plant is 900 metric tons annually. Its actual capacity, however, is much larger.

It is reported that the Ministry of Commerce and Industry has issued instructions that during the period January-April, 1939 all local rubber importers must purchase 15 kg. of the home produced artificial rubber "Ker" for every 100 kg. of crude natural rubber imported from abroad. Further, it is stated that the above requirement will be raised to 5 kg. as soon as local production is increased. The synthetic rubber is retailed at 5.60 zlotys per kg. = \$ 1.06 at the exchange rate then prevailing. In comparison, the German Buna is purchased in America at a price of \$ 0.76 per lb.

Italy.

In Italy, the Interministerial Committee for Autarchy decided that during the last half of 1939 construction work would be begun on the first synthetic rubber factory at Ferrara, promoted by the I. R. I. Pirelli group. Later, it was reported that a second factory would be erected near Rome, each with a production capacity of 1,000 kg. per day. The total production from these plants would be only about 700 tons annually, whereas Italy's annual rubber imports average 25,000 tons. The great difficulty in Italy is that the principal raw material for producing synthetic rubber *i. e.*, coal, is not produced in the country, but must be imported. (Rubber News Letter, Washington, 1939).

Competition between Synthetic and Natural Rubber.

"To what extent is artificial rubber a potential competitor of plantation rubber?" Any answer to this question must take into consideration the three factors of quality, price and political exigency. Closely allied to the question of quality is that of uniformity. Rubber, on account of its biological origin, is subject to wide variations which are a source of many difficulties to the manufacturer. Much can be done to improve the uniformity of plantation rubber, but it will never be practicable to attain the high degree of uniformity which is possible with a purely chemical product.

On the question of cost all that many be said with certainty at present is that the cost of production of rubber is far below that of any of the competitive products; and the price may still be lowered. In this respect, the high yielding buddings will contribute considerably to the successful competition of estate rubber. Furthermore, a suggestion of H. P. STEVENS (Bull. Rubber Growers' Ass., Vol. 21, p. 404) is worth taking into consideration: "Latex is still transferred to tanks where it is coagulated and from which it has to be removed by hand and transferred to machines where it is rolled and washed, each sheet being treated separately, then again handled and transferred to drying houses or smoke houses where it is again hung by hand, removed by hand and finally packed by hand. The actual operations are the same to-day as when originated by pioneers. The whole of the operation resembles in many respects the medieval process of paper-making. May I suggest that it should not be necessary to wait hours for latex to coagulate or days for the coagulum to dry. The whole process might possibly be made continuous. If the coagulum were thin enough, the coagulation and drying could be effected sufficiently rapidly for a continuous process".

The technical performance of this continuous process has already been invented by the Wingfoot Corporation at Akun (Ohio) and undoubtedly further improvements of the natural product are bound to follow. Nevertheless some of the leading authorities of the rubber industry are very pessimistic as can be seen from an article of H. N. Blommendaal in the Bulletin of the Colonial Institute of Amsterdam and reprinted in "Tropical Agriculture", Vol. XVI, No. 10, p. 221. Blommendaal being a member of the Permanent Commission of Rubber Regulation has an excellent opportunity of observing the actual situation.

The probable outcome of the competition of the new synthetic materials with natural rubber seems to be that neither product will disappear, but that an equilibrium will be reached in which both will play a part, each having its own range, in rather the same way that synthetic nitrogen and Chile saltpetre have.

One important question is whether the manufacture of synthetic rubber will have any influence on the cultivation of potatoes. Theoretically, according to a Russian report, as much rubber can be prepared from a hectare of good potato land as can be obtained from a corresponding area of hevea plantation, i. e., 500 kg. The treatment of the potatoes and the process described, namely distillation of alcohol and the conversion of this material into rubber, will make the manufacture very dear indeed, but, nevertheless it is worthy of note that the Italian synthetic rubber plant is situated in Ferrara, an important potato growing and alcohol producing district.

In any case, synthetic rubber is an article of which in the future every country will desire to supply its own needs and it is a purely economic question whether this can better be done from potatoes, coal and lime or indeed any other materials. In countries well suited to potato culture, i. e., countries with a light soil and an adequate labour supply, the preparation of synthetic rubber may well have some influence on the agriculture of the temperate zone.

MISCELLANEOUS INFORMATION

The Wheat Problem in Venezuela.

The cultivation of wheat in Venezuela dates back to the colonisation of this country but in spite of the efforts made in the past it has not yet achieved the results hoped for. At the present time production is, in fact, limited to the mountainous regions of the Andes and fails to cover the requirements of the country although a considerable proportion of the people eat white maize instead of wheaten bread, the price of which is high.

The Venezuelan Government has always taken a keen interest in this question and, in 1933, appealed to M. SCHELOTTO, an Agricultural engineer and a specialist on wheat, to find a solution. The scheme of work drawn up by M. SCHELOTTO has been published during the course of the last few years. In July 1935 an experimental station was established in the State of Merida, with a view to studying and acclimatising the different varieties of wheat that might be cultivated in the region under consideration. The quality of the wheat was studied with the collaboration of the Experimental Laboratory for Milling and Baking of the Ministry of Agriculture at Buenos Aires which has published a memorandum on "The Industrial value of several common and pedigree wheat varieties from Venezuela."

Wheat cultivation is carried out particularly at altitudes between 3,600 and 3,800 m where cultivation has the disadvantage of encouraging soil erosion and impoverishing the soil. The mean temperature is between 8 and 15°C and the rain falls mostly in spring, the annual precipitation being over 1,600 mm.

The varieties cultivated are made up of a mixture of indigenous and imported varieties; two sorts may however be distinguished (1) early wheats which have a growing cycle of 120-140 days and which are grown between 1,600 and 2,000 m above sea level on land that gives two crops per year and (2) late wheats with a growing cycle of 180-210 days which may be cultivated up to 3,800 m.

Several varieties are often to be found even in one crop, and this gives some idea of the mixed quality of the seed and the possibilities of selection.

The scheme of work drawn up by M. SCHELOTTO is to develop selection of seeds and to try them out at various altitudes for both yield and quality in order to obtain wheats of balanced properties so that they can be used for bread making without further admixture. A central station has been set up for experiments and demonstrations at 3,000 m above sea level and there are subsidiary stations at 3,500 and 2,200 m; all three stations are in the State of Merida.

Wheat improvement in Venezuela will follow progress and rationalisation in cultivation, modification of the working methods, sowing, cultivation of the growing crop and threshing and cleaning by machinery. For the last two operations recourse will be had to special machinery constructed for work in mountainous regions, but mechanisation of sowing, cultural operations and harvesting are not practicable on account of the difficulties due to the nature of the land.

Research on the Botany of the Olive Blossom.

The Italian Botanical Society has just published a booklet (MORETTINI, A. *Ricerche sulla biologia florale dell'olivo* (Firenze, 1939, 70 pp. figs. tables and bibliography) which deals with the present state of our knowledge of the biology of the flower of the olive and the researches on the principal varieties of Olives in Toscana and Perugia undertaken by the author between 1935 and 1938. The author tries to classify them into self-pollinating and self-incompatible varieties and to find the compatible varieties for the latter. His researches led him to the following conclusions (1) the varieties "Moraiolo", "Leccino", "Pendolino", "Madonna dell'Impruneta", "Morchiaio", "Dolce agogia", "Morella" and "Oliva della Spagna" are sterile and must therefore be associated in the olive gardens with a compatible variety for pollination; only the variety Frantoio is self pollinating; (2) the above varieties are not incompatible amongst themselves, (3) abortion of the ovaries in the flowers does not occur in general except to a slight degree but in the variety "Morchiaio" it occurs in a large percentage of the flowers.

A P

Tropical Fruits.

Since the beginning of the present century more and more attention is being given to the production of tropical fruits and this production has grown, though in some countries it has not reached the magnitude anticipated.

Wilson POPENOE has published an interesting study on about twenty important tropical fruits in the journal *El Campo* (Buenos Aires, May and June 1939). In this article he gives information on their production from different points of view the extent of cultivation, the principal varieties, possibilities of acclimatisation, favourable weather and soil conditions, varieties, selection, propagation and surveys of the production and export of fruit.

In particular, interesting information is given on the following the Avocado pear (*Persea americana* Miller, *P. gratissima* Gaert.), the mango (*Mangifera indica* L.), one of the most important fruit trees of the tropical zone and one whose fruit is appreciated by everyone, the cherimolia or Peruvian custard apple (*Anona chermolia* Mill) whose fruit is considered the best in the world, the common custard apple or sour sop called "guanábado" by the Spanish, (*Anona muricata* L.) which is very suitable for the preparation of refreshing iced drinks, the scaly custard apple or sweet sop (*Anona squamosa* L.), the "ilama" (*Anona diversifolia* Safford) a plant that comes from Mexico and Guatemala and is hardly known to fruit growers although it is an excellent dessert fruit, the beef apple or naseberry (sapodilla and cheku apple are other synonyms) (*Achras Sapota* L.) which also has a tasty fruit and which could be developed, the marmalade plum or Surinam medlar (Jamaica bullet, American marmalade and vegetable egg, are other synonyms) (*Calocarpum mammosum* P.); the caimit or star apple (*Chrysophyllum Caimito* L.), the green medlar or yash-tul of Guatemala (*Calocarpum viride* Pittier), the persimmon, Chinese date or kek fig (*Diospyros kaki* L. F.), the guave (*Psidium guyana* L.) and other species of the myrtaceae; the litchi (*Litchi sinensis* Sonn.) the rampostan (*Nephelium Lappaceum* L.); the mangosteen (*Garcinia mangostana* L.) and the duriw or civet tree (*Durio zibethinus* Murr.).

A. P.-J. L.

Nutritive and therapeutic value of olive oil.

The National Olive Oil Committee of Portugal, which has its head quarters at Lisboa, published a brochure of 24 pages in 1939 on the nutritive and therapeutic value of olive oil. This brochure is the third of a series which the Committee has undertaken to publish; the first two dealt with: (1) the harvesting, transport and preservation of olives and (2) the oil mill and methods for extracting the oil. Six others are in course of preparation and deal with: (1) the olive plantation its position, the preparation of the soil and the care of the plantation; (2) cultivation and yield of the olive plantation, (3) pruning; (4) diseases and pests of the olive tree, (5) varieties of olive cultivated in Portugal, and (6) list of olive trees for 1938-1939. This last is being prepared with the collaboration of the Director General of the Agricultural Services.

The degree of digestibility of oils and fats varies inversely with their melting points. The high percentage of oleic acid makes olive oil very digestible, especially for the liver. The good qualities of olive oil are shown by its general use in spite of its high price, in the fish canning industry even in countries such as Norway which do not produce it themselves.

In medicine it is used in the form of Carron oil (an unstable emulsion of equal parts of olive oil and lime water) for treating burns and also in the preparation of ointments, creams, plasters, camphorated oil, etc. At the present time it is widely used in preparing solutions for injection, the greater part of the olive oil now imported by Germany being, in fact, used for this purpose. Olive oil is also used in treating liver diseases and colitis and to enhance the secretion of bile.

A. P.

The cultivation of the Chestnut, Fig, Hazelnut and Walnut in Spain.

Fruit tree cultivation in Spain, which is being encouraged and pushed forward by the National Government, has a special place in the economic structure of the country. We will give here a few notes on a few of the more important trees.

CHESTNUT.

The regular plantations cover 27,000 hectares and have an average production of more than 2,000,000 quintals of nuts of which 70,000 quintals, with a value of 1,900,000 gold pesetas, are exported, the chief destinations being Great Britain, Algeria, Brazil, Cuba, etc. The number of trees in the regular plantations is 2,600,000, that is to say, 96 per hectare, there are a further 2,900,000 scattered chestnut trees. The principal centres of chestnut cultivation are in the provinces of Oviedo, Navarra, Orense and Guipúzcoa. The annual output is estimated at 110,000,000 pesetas per year. The tree thrives best in light soils that are also deep and rich in organic matter and silica though at the same time sweet. The principal varieties cultivated are "calva," a very choice late variety that keeps well; "amarela," an early and prolific variety "cuancho," a good variety for dry storage, and finally "rapada," a late variety with a darker coloured and smaller nut than the previous varieties.

Chestnut trees are propagated either by seed or by grafting.

FIGS.

The regular gardens cover an area of 28,600 hectares and have 2,700,000 trees, that is to say, 94 trees per hectare. The average production is about 2,500,000 quintals per year, of which 60,000 quintals, with a value of 4,300,000 gold pesetas, are exported, the chief destinations being France, Denmark, Germany, Norway, Great Britain, etc.

It is reckoned that the number of trees growing alone or in irregular plantations is round about 3,000,000. The principal fig growing areas being the Balear region (Balearic Islands) and the provinces of Murcia, Castellón, Málaga, Valencia, Almería, Tarragona, etc. The value of the products from the fig gardens is estimated at about 100,000,000 gold pesetas per year. Many different varieties are cultivated but they may be classified into three groups, white skin and flesh, coloured and black.

The fig tree thrives in all soils except those that are too wet but they grow best of all on rich calcarous soils with a sweet subsoil. The fig tree is easily propagated from seed and by cuttings, layering, grafting, etc. The dry fig trade, which is a considerable source of revenue in some districts, is a very important one. For the preparation of dried figs the best fruit is that which ripens in August or the first fortnight of September, that is to say, that which ripens before the autumnal rains and which can thus be dried in the sun, the large, sugary fruits are preferred for this purpose.

HAZELNUTS

The regular plantations of hazel occupy 8,000 hectares and include 7,000,000 trees that is to say, 212 trees per hectare. The average export of nuts is 100,000 quintals per year with a value of 20,000,000 gold pesetas, the principal destinations being Great Britain, France, the Netherlands, Germany, Belgium, the U. S. A., Argentina, etc. The exact area of irregular plantations or isolated groups of nut trees is not known but it is considerable. The principal nut growing districts are in Cataluña (80 per cent. of the area covered by the regular plantations being in this region) in the provinces of Oviedo, Córdoba, Navarra and Valencia. This cultivation reaches its highest perfection in the valley of Francoli in the province of Tarragona. About twenty varieties are known but in practice three are grown; the first is a round nut of a light colour, the second is long and reddish, both these varieties give fairly large nuts but the third gives rather smaller nuts but is very prolific.

The hazel prefers a sweet soil that is fairly moist but well aerated and sunny; marshy soils and dry soils are both unfavourable for nut cultivation. The hazel may be easily propagated by seed or by the numerous shoots that grow up round the stump. The nuts are used in several ways; they may be eaten raw or roasted, they are used in confectionery, in the preparation of drinks and sauces, in perfumery and in painting.

WALNUTS.

This tree thrives in all districts of Spain, either in groups or as isolated trees. The regular plantations cover 500 hectares and the total production of nuts in the whole country is estimated at 300,000 quintals with a value of 25,000,000 gold pesetas. Exports amount to 6,500 quintals with a value of 700,000 gold pesetas, the principal destinations being the U. S. A., Great Britain, Cuba, etc. The principal walnut growing districts are in the provinces Valencia, Burgos, León, Navarra, Zaragoza, Oviedo,

Guipúzcoa, etc. A fairly large number of varieties are cultivated and they may be identified chiefly by their size, the shape of the fruit and the hardness of the shell. The walnut is not exacting in its requirements regarding soil but it grows best in dry, light soils with a good depth and a considerable lime content. It does not grow well in moist clayey soils nor in very sandy soils. In a shallow soil the roots of the walnut extend laterally and interfere with the growth of other plants. Under the shade of a walnut tree hardly any plant survives because the rain water that falls on the leaves washes out tannin which is thus carried down to the soil. Walnuts may be propagated by seed or may be grafted; grafting as a rule is practiced when the trees have a girth of 10 cms and are about 1.50–2.00 metres high. The walnut does not grow well or bear much fruit except when isolated; it is for this reason that it is not grown to any extent in regular plantations. The nuts are eaten fresh or dried, in the latter case they are a nourishing food. They are also used in confectionery, etc. and the kernels of the fruit contain 65 per cent. of oil which is used locally.

A. P.

The cultivation of the cork oak and the cork industry in Spain.

The cork oak is a characteristic tree of the Mediterranean basin and is widely distributed in Spain, where the exploitation of *Quercus suber* supported a flourishing industry until 1930 since when it has suffered from the crisis which has stricken both the cultivation and the corresponding industry.

About 1830 the inhabitants of several villages in Cataluña (Bas Ampurdan and Selva) started the manufacture of corks from the bark of the cork oak, which they sold in the south of France. Towards the middle of last century the manufacture was industrialised, though still retaining its patriarchial organisation, and the goods manufactured (round and square corks for the most part) were then exported not only to France but also to England, Germany, Belgium, etc. In 1870, there were in Spain (mainly in Cataluña) 850 factories for the manufacture of cork giving employment to 12,000 workers in 110 villages. In 1900 the number of factories reached 1250 and employed 34,000 workers in 175 villages. In the earlier years of the present century, other countries producing cork (Portugal and Algeria in particular) competed with Spanish production and caused a crisis which led to the disappearance of a number of the smaller factories, of which the plant had become inadequate for the manufacture of different cork products; thus in 1920 there were only 400 factories in production, most of which were in Cataluña.

The cork oak forests of Spain cover an area of 500,000 hectares. The tree grows in all parts of the country but the chief centres of production are Extremadura, lower Andalucía and Cataluña (Province of Gerona). The cork grows better in a maritime climate than in a continental climate; for the trees growing in proximity to the sea grow more rapidly and yield finer and more elastic cork. The tree thrives on the low hills (300–600 m) though it is found as high as 800–900 m in Andalucía. A warm sheltered position with a sandy soil is the best situation for the tree whilst calcareous or moist clayey soils are distinctly unfavourable to the growth of the cork oak.

Production varies considerably from one region to another. As a rule the bark is stripped every ten years and the production of a mature tree stripped once or two metres high amounts to 40 or 50 kilos of cork each ten years. In Cataluña the bark is collected at the beginning of the summer and in Andalucía at the end of the spring. The tree is first stripped of its bark when it is twenty years old, that is, when it has attained a girth of 40 cms, the yield is then 5–6 kgs of bark per tree, there is also a considerable yield of acorns a food that is relished by pigs.

Spain is the second country in the world as regards cork production; the first is Portugal and the third is Algeria.

The production of cork, in spite of the crisis from which it is now suffering, amounts to more than 1,000,000 quintals per years, that is to say 500,000 square metres and, in 1929-30, the value was reckoned as 175,000,000 gold pesetas

Before 1914 the cork exports of Spain consisted almost entirely of chives, bungs and corks but in 1920 a start was made in the manufacture of other articles (disks, compressed cork, cork paper, linoleum, cork wool etc.).

In 1929, 1,000,000 quintals of cork were exported (including 269,000 quintals of cork in sheets, 288,000 quintals of shavings and cork dust, 7,000 quintals of cork blocks; 49,000 quintals of bungs and corks, 10,000 quintals of discs, 6 quintals of life saving apparatus, 700 quintals of paper and 379,000 quintals, of compressed cork. The value of these exports was 156,000,000 gold pesetas. Since 1929 the exports have decreased continuously, 107,000,000 gold pesetas in 1930, 32,000,000 gold pesetas in 1931 and a constant level of 25,000,000 gold pesetas seems to have been reached in the subsequent years

Crude cork is exported to the U S A and to France; before 1936 there were also considerable exports to the U S S R as well. The manufactured cork articles are sent to all countries of the world, France taking a large proportion of the corks and bungs

The wood of the cork oak is appreciated by carpenters who use it for making tool handles, etc and in carriage building. The bark also contains considerable quantities of tannins and is widely used in tanning leather

A P

BOOK NOTICES *

LAFITE CH & CAUDRON J *Le fumier artificiel en agriculture, en culture maraîchère*. La Maison Rustique, Paris 1939, 2^{ème} édition, 64 p, 11 fig

This is a second edition of a booklet that has done much to popularise the correct methods for preparing composts (artificial farmyard manure) in Champagne. After an account of the experiments made, it gives the following details regarding the cost of the process. 1,000 kgs of straw yields 2,500 kgs of artificial farmyard manure and thus gives a good return for the value of the straw. Farmers and market gardeners are advised to make composts with the available straw instead of selling it.

The preparation of mixed manures is also considered. In both cases the use of compost pits, as proposed by GERARD is recommended. This has been adopted in the neighbourhood of Epernay by the firm Moët and Chandon for the manufacture of 2.5 metric tons of artificial farmyard manure annually.

G R

CERIO Edwin *Flora privata di Capri*, Editrice Rispoli Anonima, Napoli, 1939, 211 p.

Under this somewhat fanciful title there is a description of this enchanted Mediterranean islet which reveals a tender feeling for plant life. It is not a flora in the ordinary sense of the word, neither a systematic numeration of the species occurring

* Reviews of books presented to the Library appear under this heading.

nor a description of their characteristics; rather is it a poetical description of the plant communities and of the life of the plants in the different ecological zones. Interspersed in the book there are many digressions into the worlds of fable and history and particularly to the history of the botanical exploration of the island.

The book reads like a novel and can fairly be called a romance, every page reflects the great love of the author for his island.

N G

CANNATA, V. *Le olive da tavola*. Tip. Coniglione e Giuffrida. Catania, 1939. 89 pp. 4 figs.

Prof. Cannata, of the Fascist Confederation of Farmers needs no introduction to the public for he has spent long years on the study of Italian olive cultivation and has a thorough knowledge of his subject. The cultivation of olives is a thing of first rate importance in Italy and has become of topical interest for, formerly neglected, it has been assisted in the last few years by the Fascist Government with very encouraging results.

In particular, production and trade in table olives has suffered a set back since 1925. In this book ("*Table Olives*"), which is principally a summary of the studies made by the author on the subject, there is a description of the varieties of table olives grown in Sicily. The author then goes on to some general considerations on the production of, and trade in, table olives and olive oil in Italy and on the means of improving it. One chapter, perhaps the most interesting, deals with the different methods of preparing green and black table olives and with the nutrient value of this product.

In view of the small amount of literature devoted to this aspect of olive cultivation which is really of considerable importance in the Mediterranean countries like Spain, Greece and Algeria, this volume is an important contribution to the knowledge of the question in Italy.

A P

HARLAND, SYDNEY CROSS *The Genetics of Cotton*, Jonathan Cape London, 1939. 133 pp. illustr.

A great part of our present knowledge of the genetics of the cotton plant is due to the author of this book and his colleagues H. J. DENHAM, J. B. HUTCHINSON and A. SKOVSTED. The British Cotton Industry Research Association undertook the first cytological researches which were carried out in their Manchester laboratory. The Empire Cotton Growing Corporation founded the research station in Trinidad in 1920 and so allowed the research workers mentioned above to continue their purely scientific work on the genetics and physiology of cotton without other distractions. No one anticipated that this work would bear immediate practical results but it was from the very beginning realised that it was necessary to establish a solid basis by a study of the botany of the cotton plant in order to make any noticeable advance in the cultivation of cotton. It seems that the famous researches of William Laurence BALLS, the precursor of all modern research workers engaged on cotton, was the inspirer of the founders of the Cotton Research Station of Trinidad in their noble enterprise. It is to him that the author dedicates his work.

This work, although it is an endeavour to cover all the work done all over the world, deals mainly with the results obtained at Trinidad. In fact, it is nothing else but a second edition of the monograph published under the same title as the 6th volume of *Bibliographia Genetica*. It is addressed of course, in the first place to persons carrying out similar work on the genetics and selection of cotton but it does not omit to include at the same time the more general question of the origin of the cultivated plants. There are few plants of which the genetics are better known than those of the cotton plant and there is no doubt that the breeder and, through him, the cotton grower will profit in the end by the knowledge obtained by the geneticists after long years of hard work.

The subdivision of the subject matter is logical, the contents are divided into three chapters, taxonomy, cytology and genetics. The author analyses the principal

genetic characteristics and then discussed their relationships. He gives a list of the genes and treats of the mutations and the hybrids between the species of the genus *Gossypium*, mentioning the importance of polyploidism and haploidism, and finally gives a historical summary of the evolution of the genus *Gossypium*.

It is unfortunate that this work was not available when the Institute prepared its book on the selection of cotton and the distribution of improved seed.

We recommend the readers of our study "Cotton Breeding and Seed Supply" to consult this work which is complementary to ours on a number of points.



W. B.

Rapport des Essais de Gasogènes. Comité Central de Culture mécanique du Ministère de l'Agriculture, Paris, 117 pp. tables diagrams, etc.

After their first enthusiastic reception, producer gas units for internal combustion engines soon fell into disfavour as a result of many failures and the inadequate adaptability of the new apparatus. At the present time there is vigorous propaganda in France conducted by the "Administration des Eaux et Forêts" for what Prof. COUPLAN calls "forest gas". The technique of producer gas production seems to be worked out and the difficulties involved in its use seem to be only questions of practice, the most serious of which are (1) the rapid kindling of the generator, starting up after a stop and acceleration, (2) the time taken up by cleaning and maintaining the generator and the filters, (3) the weight and clumsiness of the generator (4) the loss of power as a result of applying producer gas to a petrol motor and (5) the cost of the whole apparatus (generator, accessories and cost of fixing) and the price of fuel. The "Comité central de Culture mécanique" has now taken up the question and trials have been carried out by the Army on different roads and over different types of country, the "Station d'Essais des Machines" has made similar trials in the field whilst laboratory experiments have also been carried out, the ultimate aim of this work being to overcome the above mentioned difficulties. The "Offices des Combustibles liquides" (Liquid Fuel Office) and the charcoal producers have both been consulted and are giving their help in the solution of this question, in particular with regard to the production of charcoal that corresponds as closely as possible to the specification of the makers of the generators. In this way it has been possible to collect a considerable documentation to serve as a basis for systematic research on new methods of carburation and the production of fuel, better suited to the needs of producer gas generators and cheaper.

The report under discussion describes the present state of researches on these producer gas generators in five chapters which deal with the following topics.

In the first chapter on the research programme and methods, the results obtained by the Ministry of Agriculture research station are described. As a result of an enquiry among the makers the following standards were agreed upon with reference to the fuel:

(1) *Crude wood for generators using wood.*

Size of pieces: 10 mm minimum to a maximum of 60 mm for any side or diameter,

Humidity: maximum 20 per cent;

Type as a rule any wood will do but hard woods are preferred, as much because of the increased density of packing as their higher calorific value. In most cases a mixture of hard wood and resinous wood was found to give the best results.

(2) *Wood Charcoal:*

Humidity, maximum 6 per cent.;

Packing density minimum 200 kgs per cubic metre for charcoal destined for use in non-producing regions. This condition is introduced to avoid the necessity of too frequent refilling.

Screen size: as an optimum 25 mm with a tolerance of 15—20 mm, more or less according to the particular case. It is necessary to specify that large pieces of charcoal exceeding 50 mm. are not to be included.

(3) *Coal*: to be employed in admixture with wood charcoal (only in certain types of generators); semi coke, anthracite and slightly gassy coal (quart-gras).

The measurements for the determination of the most important data were made on the bench with a generator coupled to a 4 cylinder Delahaye petrol engine developing 45 H.P. at 1400 r. p. m.

Chapters II and III (Trials of Generators and Fuels and Tables of Measurements carried out at the Machine Testing Station) give experimental data obtained in the course of trials of machines and fuels, these data are further analysed in Chapter IV. (Analysis of Results).

In the examination of the results it was found impossible to state exactly which fuel was best nor which type of generator was best without taking into consideration outside factors (temperature humidity and barometric pressure) which varied from day to day, and the number of variables among constructional details on the one hand and other factors—chemical physical and mechanical—on the other did not permit any one of the arrangements, processes or fuels to be investigated singly. For example, a generator that normally gave a fairly high output (30–31 H.P.) with certain vegetable charcoal—mineral coal mixtures was unable to develop 10 H. P. regularly with an anthracite known to be of good quality or any output at all with a semi coke. Other generators even though specially constructed for a given fuel never reached the power given as a maximum and, though constructed almost exclusively for wood charcoal, had an output equivalent to their normal output 27–30 HP. when run on a mixture that contained 50 per cent. of coal (anthracite).

Calorific value is not a sufficient qualification by itself for a fuel to be set above others thus, anthracite with a calorific value of 7,750 gave in a generator designed for wood charcoal, an output of 27.9 HP., a little less than that given by wood charcoal which has a calorific value of 6,603, whilst the same fuel in another apparatus gave an output equivalent to about 40 per cent. of the normal output of the engine.

Amongst the wood charcoals charcoal produced by burning in the usual stacks, though very irregular in shape (oak charcoal from Mont de Marsan), allows a power equal to that obtained with a purified charcoal. There are therefore other factors that come in at the same time both in the construction of the generator and in the behaviour of the charcoal and it is necessary particularly as regards the latter—to consider the physical characteristics of the size and the interstitial spaces in the charge as well as the non combustible and unburnt part.

As regards practical trials and the use of these generators in practice a distinction must be made between the maximum power developed and its irregularities and the specific consumption of the fuel (H. P. hours) in relation to the clinkers and ash formed by the different fuels.

The effect of the humidity on the conditions of working, the magnitude of the loss of material in the filters and the actual methods of kindling, the working of the filters and ease of charging will also be the subject of investigations.

The maximum outputs maintained during a three hour run do not seem better in any one of the different types in comparison with others. They are about 30–32 H. P. with certain fuels and are reduced to 27–28 H. P. with others. Wood fired generators have maximum outputs inferior to those previously mentioned by several H. P., unless fired with very dry wood or wood that has been heated. Thus, the two wood-fired generators developed 31.6 and 28.95 H. P. respectively with wood that had been heated but they only developed 23–27 H. P. with ordinary wood.

Coal and semi-coke in particular have not given results equal to those obtained with wood charcoal. Semi-coke could develop 24–29 H. P.; mixtures of charcoal and anthracite or semi-coke were able on the other hand to maintain maxima of 31.1, 30.9 H. P. and 29.1 compared with 30.8, 30.3 and 29 H. P. with wood charcoal.

The usual sorts of wood charcoal (whether burnt in stacks or in kilns) gave maxima that were inferior to the above by about 1 to 1.5 H. P. White oak charcoal from Caradache and beech and elm charcoal from Mont-de-Marsan were however equal in this respect to the more refined industrial charcoals. This remark only applies to generators with a large section for the passage of gas.

Variation of the power developed during a trial is most frequently the result of the formation of clinkers or irregularities in the fuel when the system is established; they are most noticeable when mineral coal is used and especially with coke or semi-coke when the generator has its effective section for the passage of gas reduced as a result of an inadequate removal of clinkers.

When variations of the order of 7-8 per cent are caused by the use of wood charcoal, their causes are to be found in the irregularity of the fragments, and it is necessary to avoid fuels which have a proportion of lumps of 10-12 cms anywhere approaching 20 per cent

Wood fired generators are subject to variations of 9.2 to 13.8 per cent if the fuel is not specially prepared

The quantities of ash formed vary according to the source of the fuel and the heating process in the generator. It is of importance almost exclusively in coal fired generators and especially in those which are coke fired

Charcoals do not produce such considerable quantities of clinker and with wood they may be considered non-existent. The fuel consumption per H.P. hour under the trial conditions has been found for the maximum power and regularity and approaches 460 grms (approx.) with generators working by engine section with a large cross section for combustion. This figure reached 475-560 grms when the same apparatus were used for coke or semi-coke and 470-670 grms per H.P. hours when using mixtures of wood charcoal with mineral coal, the average for industrially prepared charcoal was 550 grms and for mixtures 500 grms per H.P. hour

Similar results were obtained with generators using a blower and having a smaller section, if wood charcoal and definite mixtures were used, but when the quantity of anthracite or semi-coke became excessive higher consumptions than those mentioned were observed, with semi-coke the consumption may reach 580 grms

In a wood fired generator the consumption was 1.42 to 1.68 kgs per H.P. hour, in generators for mixed fuels 800 to 500 grms of wood were used as against 160-152 grms of wood charcoal (zone of reduction) per H.P. hour

These figures do not refer only to the conditions of the experiment, they are simply collected from an examination of ordinary figures. The consumption is increased by the length of time running on the road and particularly by the extinction of the fire, a factor that takes on a considerable importance in an effective run of three hours

H J H and M T

Prof. UGO PAPI, *Segretario generale dell'Istituto, Direttore responsabile.*

PRINTING OFFICE 'CARLO COLOMBO' — ROME, FEBRUARY 13, 1940.

MONTHLY BULLETIN

OF

AGRICULTURAL SCIENCE AND PRACTICE

A SURVEY OF FILMS ON AGRICULTURAL SUBJECTS *

2 FINLAND (1)

The organisation of agricultural films in Finland is comparatively recent.

In 1933 special archives for films were set up with the name "Pellervon elokava arkisto" in which the company Pellervo collaborated", by 1938, 175 films were included and about 2400 showings were given.

The manufacture of films dealing with Finnish agriculture has an utilitarian orientation, the majority of the films hitherto made having agricultural propaganda as their aim. An attempt has been made to inform the public, in the first place, of the national agricultural resources rather than to instruct in the strict meaning of the word. Thus, there is often a commercial note underlying the films and industrial establishments having a clientele that is largely rural have had films made for the purpose of encouraging and stimulating the consumption of certain articles or wares. The State itself accords subsidies more readily if nationally produced agricultural goods are the subject of the propaganda.

Though interest in educational films on agricultural subjects is still limited, recently certain agricultural schools have contemplated the purchase of projection apparatus but up to the present use has been made only of slides.

The agricultural syndicates have an extensive collection of lantern slides; it is reckoned that there are about 800, divided into 14 series and classified, in the archives of the Central Federation of Agricultural Societies. Recently several instructional films have been made but it may be said that, from a purely educational point of view, the production of films in Finland that are suitable for international exchange is almost negligible.

The production and circulation of agricultural films are in the hands of two organisations, the Central Federation of Agricultural Societies (Maatalousseurojen Keskusliitto and the Pellervo Society (Pellervo-Seura).

The first undertakes the renting of the instructional agricultural films made or subsidised by the state to associations for the dissemination of agricultural information and to agricultural schools.

* A previous article in this series dealing with Italy appeared in this *Bulletin* January 1940.

(1) This report is compiled from information received through the Finnish Legation at Rome supplemented by the report given by M. ILMARI ROHOLA at the Eighteenth International Agricultural Congress at Dresden, June 1939.

The second, which has a collection of about 100 films made in Finland or abroad and uses them for its own agricultural propaganda, also lends them to co-operative societies and agricultural organisations.

These films are of small gauge (16 mm) and the apparatus used is American (Filmo) or German (Siemens); the majority are short, few exceeding 120 m.

The money for the production of such films is usually granted by the State or by the co-operative societies who also give considerable subsidies.

The following is the list of films stated to be suitable for international exchange.

LIST OF FILMS PRODUCED IN FINLAND DEALING
WITH AGRICULTURAL SUBJECTS.

1 — *Finnish Agriculture*

Length, 5,600 m., in 21 parts dealing with the general development of agriculture, the cultivation of fields, stock breeding, horticulture and the question of intensive cultivation and agricultural education (normal film 32 mm.).

The same on 16 mm film, — 1800 m.

Producer: The Ministry of Agriculture, released in 1931

Distributors: Central Federation of Agricultural Societies

Subject: Instructional.

Silent film with Finnish and Swedish sub-titles

2 — *The Twelfth General Agricultural Exhibition at Vimpuri*

Length. 400 m. 32 mm - 1 part

Producer: Ministry of Agriculture, released in 1932

Distributors. C. F. A. S.

Subject: Propaganda

Silent film with Finnish and Swedish sub-titles

3 — *Sheep breeding.*

Length. 300 m—16 mm—1 part

Producer: C F A S and the Sheep and Goat Breeding Society, released in 1937

Distributors. C. F. S. A.

Subject. Instructional

Sound film: (music and commentary).

Language: Finnish

4 — *The Builders of the New "Sampo"*

Length: 200 m—16 mm—1 part.

Producer. The Confederation of Finnish Industries, released in 1936.

Distributors C. F. A. S.

Subject: Propaganda for collaboration between agriculture and industry.

Sound film: (music and commentary).

Language. Finnish.

- 5 — "Eat more Cheese!".
Length: 140 m.—16 mm.—1 part.
Producer: Pellervo Society (P. S.).
Distributors: Archives of P. S.
Subject: Household management.
Silent film with Finnish sub-titles.
- 6 — *Venison for the Prince and Meat for the Worker.*
Length: 140 m.—16 mm.—1 part.
Producer: P. S. released in 1936.
Distributors: Archives of P. S.
Subject: Reindeer breeding and propaganda for reindeer products.
Sound film: Commentary.
Language: Finnish.
- 7 — "The Good Egg".
Length: 192 m.—16 mm.—2 parts.
Producer: P. S.
Distributors: Archives of P. S.
Subject: Poultry farming and propaganda for the consumption of eggs.
Silent film.
8. — *The development of pig breeding at Korpimäki.*
Length: 244 m.—16 mm.—3 parts.
Producer: The Finnish Pig Breeding Society.
Distributors: Archives of S. P.
Subject: Propaganda for pig breeding.
- 9 — *From Forest to Port.*
Length: 120 m.—16 mm.—1 part.
Producer: Sylvicultural Organisations.
Distributors: Archives of P. S.
Subject: Sylviculture.
Silent film.
- 10 — *Making Acid Silage.*
Length: 410 m.—16 mm.—5 parts.
Producer: Valio Butter Exporting Company.
Distributors: Archives of P. S.
Subject: Making silage by the A. I. V. process.
Silent Film.
11. — *How good seed is grown.*
Length: 130 m.—16 mm.—1 part.
Producer: Central Co-operative Society, Hankkija.
Distributors: Archives of P. S.
Subject: The importance of good seed.
Sound film: Music and commentary.
Language: Finnish.

12. — *The Forest of Apple Trees.*

Length: 75 m.—16 mm.—1 part.

Distributors: Archives of P. S.

Subject: The cultivation of fruit trees.

Sound film.

Language: Finnish

13. — *Flax.*

Length: 75 mm.—16 mm.—1 part.

Distributors: Archives of P. S.

Subject: Flax cultivation and linen manufacture.

Sound film.

Language: Finnish.

14 — *Drainage.*

Length: 600 m —16 mm.—3 parts.

Producer: Finnish Drainage Society.

Distributors: Archives of P. S.

Subject: Drainage

Silent Film.

15 — *Cleaning Seed*

Length: 100 m.—16 mm.—2 parts.

Producer: Hankkija.

Distributors: Archives of P. S.

Subject: Instructional.

Silent film.

16. — *The Green Gold of Finland.*

Length: 100 m.—16 mm.—1 part.

Producer: Sylvicultural Organisation.

Distributors: Archives of P. S.

Subject: Sylviculture.

Silent film.

17. — "*Cheese Again!*"

Length: 135 m.—16 mm.—2 parts.

Producer: P. S.

Distributors: Archives of P. S.

Subject: Propaganda.

Sound film.

Language: Finnish.

18. — *The Importance of Lime in Agriculture.*

Length: 200 m —16 mm.—2 parts.

Producer: Reinforced Concrete Company.

Distributors: Archives of P. S.

Subject: Propaganda.

Silent Film.

19. — *Pasture Management in Finland.*

Length: 200 m.—16 mm.—2 parts.

Producer: Pasture Society.

Distributors: Archives of P. S.

Subject: Pasture management.

Silent Film.

20. — *Turku, The Port for Agricultural Exports*

Length: 150 m --16 mm --1 part

Producer. Archives of P S

Distributors: Archives of P S

Subject Agricultural exports.

Silent Film

Besides these there are several others which were mentioned in a communication to the International Agricultural Congress at Dresden (1939) on the subject of agricultural films in Finland.

SILENT FILMS

Fishing under the ice at Rymattylä

The pastures of Finland, laying down pastures and their care and use

Our sheep breeding industry.

Arrival and loading of agriculture products at Turku

Dainties.

Propaganda for reindeer breeding and reindeer products.

The dairy machinery industry in Finland

The Finnish wool industry -- Sheep folds and the preparation of wool.

The manufacture of ices and propaganda for their consumption

Wood manufactures of Finland

SOUND FILMS.

Fish breeding in Finland --Piscicultural Establishments.

The builders of the new "Sampo" -- Collaboration with industry

Safety, Profit and Health -- The use of concrete.

Dainties.

Reindeer breeding and propaganda for reindeer products

The farmer and concrete

The Forests that enrich the Country -- The importance of silviculture and wood manufactures.

THE ORGANISATION AND ENCOURAGEMENT OF HORSE BREEDING IN EGYPT *

Historical Review.

The horse has been known and used in Egypt since very remote times. The Egyptian horse seems to be a mixture of the old Egyptian horse, the horses of the Mediterranean Islands, and the Syrian horses. The breeding of horses was not conducted according to any scientific method, but when Abbas Pasha I was touring Arabia about 1845 he became interested in the Arab horses and brought some of the best back with him. He paid great attention to their breeding and registering, and presented some of their progeny to his intimate friends. Before long many of the Pashas took to breeding Arab horses.

This went on till the Royal Agricultural Society, founded in 1898, took up the subject in 1908, the Society chose some of the best and started a stud book. A great deal of attention was paid to their breeding and their progeny increased; at first only Arab horses were bred but later on the Society included some English Thoroughbreds.

None of the Provinces of Egypt had any good stallions, except those kept by a few rich people for their own mares. The Society, having by then a good number of stallions, established service Stations all over the country. It was evident before long that these service Stations had effected a great improvement. The stallions were both pure Arab and Thoroughbred. The progeny of the Egyptian mares served by Thoroughbred stallions was of a high standard, big, with strong bones and legs while the progeny of the mares which were served by the Arab stallions was almost up to the Arab standard with a pretty look and brisk light movements. The stallions travelled from one district to another every two years. Service books were kept in the Police stables under the supervision of the local veterinary sections.

But the breeding of horses in Egypt is, of necessity, very limited. The agricultural land is level and very fertile and consequently of a high rental value, it is used mostly for the production of cereals and valuable crops throughout the year, so curtailing the opportunities for horse-breeding; another unfavourable factor was that the demand for horses was limited to racing and draught. The Army used only a small number as the Cavalry section in the Egyptian Army was not as big as in some other countries. Thus the best horses were sold to the few who wanted them for racing whilst the ordinary or inferior horses were sold for draught purposes to people who could not pay the prices asked for the best horses. The Army bought good horses and paid well but the number required every year was a small one.

* This report was prepared at the request of the Institute by the Egyptian Ministry of Agriculture and sent to the Institute on October 23, 1939. It forms part of the series of articles on the "Organisation and Encouragement of Horse Breeding in various Countries" The preceding articles were published in the Bulletins of July 1937 (p. 250), January 1938 (p. 12), October 1938 (p. 396), June 1939 (p. 215), October 1939 (p. 361). See also the article "Horse Breeding in England and Wales" in the Bulletin for November 1939 which though slightly different in form from the other articles relates to the same subject.

The Present Situation.

There are only very few private farms for horse-breeding. They are about four in number each having about 15 mares. At the present time the Society possesses 24 mares, 28 colts and 27¹ fillies, besides 50 stallions which are distributed in 26 districts of Egypt. Some big farms keep mares for the production of horses and mules for draught; their production is usually limited to their annual requirements.

Many a good horse breeder has had to withdraw from the market and give up this industry. The reasons are obvious; the roads have been improved a great deal and cars and lorries have increased to satisfy the present need for speed and though the Egyptian Army has grown in recent years like all modern armies, it is a mechanized force.

As to the Government Farms, there are in the State Domain about 100 mares; the Royal Agricultural Society supplies both the Private and Governmental farms with the necessary stallions. This Society has the only farm for the production, breeding and distribution of stallions. The Ministry of Agriculture has about six mares of good ancestry for the production of stallions to be distributed in the Ministry's four farms and to be used for service in the surrounding districts.

There are no special laws or regulations for horse-breeding. There is no common stud book but each farm keeps its own. Each mare is well examined before being served to make sure of its condition, then all relevant information is entered in a special book.

Other Schemes for the encouragement of horse-breeding.

There is a special council for the improvement of horse-breeding under the chairmanship of the Minister of Agriculture. This council arranges annual shows and gives prizes for the owners of good horses. The council is supported by the money the race clubs pay the Government. The council possesses some studs which are distributed in the districts where neither the Agricultural Society nor the Ministry of Agriculture have studs.

ORGANISATION OF MILK RECORDING IN DIFFERENT COUNTRIES HUNGARY *

Development of Milk-Recording.

Milk recording was practised for the first time in 1897, by the Magyarovár Cattle Breeders' Association. A considerable number of milk recording associations were established during the first decade of the present century and at the outbreak of the war 37 associations existed in Hungary, 28 of which func-

* This article is a continuation of our enquiry on the organising of milk recording in different countries one part of which has already been published in this *Bulletin*. The above was drafted by the Hungarian National Herd Book Committee, which was entrusted with this task by the Royal Hungarian Ministry of Agriculture, and transmitted to this Institute on December 16, 1939.

tioned in areas that are still included in Hungarian territory. During the war all these associations, with one exception, were compelled to abandon their activities and it was not until 1920 that milk recording was again practised, the first unit to resume its activities being that of the Fejér District. The subsequent development of milk recording was very rapid and today there is no Comitát without its milk recording association.

TABLE I. — *Development of Milk-Recording.*

Years	Number of milk recording Associations	Number of milk-recording units	Number of herds tested	Number of cows tested	Percentage of cows tested to total number of dairy cows
1920-21	1	4	18	1,316	—
1922-23	1	6	30	1,677	0 19
1924-25	1	6	38	2,104	0 23
1926-27	10	30	211	9,549	1 05
1928-29	16	50	452	16,831	1 84
1930-31	20	64	569	24,060	2 66
1931-32	22	50	496	19,026	2 10
1932-33	23	53	508	20,111	2 23
1933-34	24	68	718	29,502 (b)	3 3
1934-35	24	77	896	36,105 (b)	4 0
1935-36	24	86	971	39,619 (b)	4 4
1936-37	24	96	1,097	44,014 (b)	4 9
1937-38	24	107	1,273	47,379 (b)	5 3
1938-39	a) (+ 6) 26	—	—	—	—

(a) These six societies are now being organised with the assistance of the appropriate Association in the territories recently joined to Hungary

(b) These figures refer to the number of cattle within the frontiers of 1938.

Organisation of Milk-Recording.

Each Association's sphere of activity covers one Comitát. In cases of necessity, however, any Association may be divided into several units each comprising the number of herds that can be tested by the same recorder. The Milk Recording Associations are grouped into 5 Federations, each of which functions in one of the five territorial units of Hungary.

In addition to the technical management of the associations, the Federations give their attention to the keeping of Herdbooks. All the Federations, together with the associations grouped under them are under the supervisions of a National Herdbook Commission, set up by the National Agricultural Association. The entire activity of these organisations is under the ultimate supervision of the Royal Ministry of Agriculture.

The recording in the case of large estates is exercised separately from that of peasant holdings.

Milk recording Associations are subsidised by the Ministry of Agriculture, which provides them with all the necessary equipment. On the other hand, the Royal Ministry of Agriculture issues uniform rules for the work of the Asso-

ciations, strict adherence to which is compulsory. Directors of the Federations are appointed and paid by this Ministry.

Testing is carried out by recorders, known as recording assistants. The necessary qualification for this work, in addition to attendance at a general school of agriculture, is the taking of a special course in milk recording.

Methods of Milk-Recording.

Visits for recording purposes are made once or twice monthly according to a plan. By means of the BESSEMER balance the recorder weighs the quantity of milk yielded by each cow at each milking. The butter fat content is ascertained by means of the GERBER method; while the BESSEMER balance is also used for the purpose of determining the food consumption. The recorder does not confine himself to testing, but also advises breeders on matters connected with the breeding and nutrition of the animals.

Calculation of results.

In order to ascertain the annual production of each cow, the figures recorded at each visit are multiplied by the number of days that have elapsed since the last visit and the total of the results thus obtained gives the annual production. The same procedure is followed in order to determine the quantity of butter fat produced and food consumed annually. By means of these data it is possible to ascertain the yield of each cow. The recorders' calculations and reports are verified by the board of the Federation.

Utilisation of records.

Data obtained by means of milk recording are entered in the Hungarian Herdbooks. In addition to the ordinary Herdbooks there are also, in Hungary, a Register of Merit and a Special Register for animals of outstanding value in which the animals are registered according to their yield performance. These books contain four sections:—

(1) The " Register of approved, animals " for pure bred animals of the Simmental, Brown Swiss and Holstein cattle that have been classed, on inspection for eligibility, at least in Class II, and, for a period of 305 days, have shown a minimum production of 4000 kg. (8819 lb.) of milk, in the case of Simmental and Brown Swiss, and 4500 kg. (9921 lb.) in the case of the Holstein cattle, with 140 kg. (320 lb.) of butter fat.

(2) The " Register of Merit " for the red-spotted Hungarian breed. This includes cows, classed, on inspection for eligibility, at least in Class II that have yielded a minimum of 4500 kg. (9921 lb.) of milk and 160 kg. (353 lb.) of butter fat during a lactation period of 305 days.

(3) The " Performance Register of Merit ", which includes cows belonging at least to Class IV, which have yielded a minimum of 6000 kg. (13,228 lb.) of milk, 7000 kg. (15,432 lb) in the case of the Holstein and 210 kg. (463 lb.) of butter fat during a lactation period of 305 days.

(4) A further section includes all the cows that have, in a period of five consecutive years, produced four healthy calves and yielded 700 kgs (1540 lb.) butter fat.

Bulls that have at least ten daughters on the Register of Merit are also included and all cows that have bred for ten years or more and have produced six healthy calves followed by lactations of 2,500 kg. (5,500 lb.) milk and 90 kg. (198 lb) butter fat are similarly included.

A general requirement for all cows registered in Registers of Merit is that the interval between two calvings should not exceed 14 months.

Bulls belonging to Class II, whose dams were registered in the Register of Merit are also placed on the Register of Merit.

On November 8, 1939 the sections of the National Register of Merit contained a total of 3134 cows.

Results of Milk Recording.

Table II shows the results obtained during recent years.

TABLE II. — *Mean and maximum yields obtained 1933-34 to 1937-38.*

Year	Best averages of production		Average production	
	Large Estates	Small Farms	Large Estates	Small Farms
	Kg Milk		Kg Milk	
1933-34	6,480	3,917	3,601	2,826
1934-35	7,157	4,598	3,397	2,692
1935-36	6,778	4,215	3,540	2,776
1936-37	6,822	5,104	3,496	2,892
1937-38	6,600	5,147	(a) 3,314	(a) 2,774

(a) The reduction in output is due to foot and mouth disease

THE MANUFACTURE OF AGRICULTURAL MACHINERY AND INTERNATIONAL TRADE FROM 1929 TO 1938

General.

During the last decade the mechanisation of agriculture has undergone changes due to the world economic crisis and to other factors. Before the crisis, in several overseas countries, there was a tendency towards a sort of industrialisation of agriculture and towards monoculture carried out with machines as big as possible. The crisis of 1929 struck such undertakings most heavily and it also became apparent that monoculture and the consequent exhaustion of the soil had a considerable influence on the increase of soil erosion caused by wind and water and on the diminution of the general level of fertility in all countries.

Everywhere the absolute necessity of conserving soil fertility by all possible means was recognised and more and more attempts were made to adapt technical methods to the needs of agriculture and no longer to submit agriculture to the full potentialities of machinery, as in the past, to the detriment of farming in the countries in which these potentialities were greatest.

Tendencies of the Evolution of Agricultural Machinery.

A considerable reduction in the use of machinery was noted in the years from 1931-34 in almost all countries and this has in fact had a beneficial effect on the development of agricultural technique

As regards the use of machinery in agriculture, new ideas have been put forward which will lead towards new technical solutions of many problems. The evolution of agricultural machinery in the last decade has been essentially a matter of rendering the machinery suitable to the needs of small and medium-sized farms and to peasant holdings. It is agreed that such mechanisation is limited by the reduced area worked, the reduced purchasing power and the frequent subdivision of small properties which often threaten their existence.

Consequently in regions where small properties are the rule, and especially in Central Europe, more and more need is felt for unifying and rationalising the farms and, in connection with this, of eliminating the smallest and most unremunerative to the advantage of medium-sized peasant holdings. Without this re-organisation it is impossible to improve or mechanise small farms on rational lines. In some places the peasants, it is true, make use of certain machines in common and carry out a uniform working, cultivation and harvesting over areas belonging to several owners but this development only shows more clearly the need of creating larger unit areas in which to work. In Germany, in the last few years, this question has been keenly studied with a certain measure of success and it is found to be closely bound up with the question of the mechanisation of agriculture. The formation and maintenance of working units large enough, to support one family is a problem of the greatest importance and a problem that is one of the most difficult of solution in densely populated areas. Amalgamation of the properties is useless unless it is possible to prevent a new subdivision when the property is inherited, this is not entirely a legal problem but one of finding an outlet for the excess population by further settlement. The great land improvement schemes undertaken in several countries bear witness to efforts in this direction but the whole question must be even more deeply studied.

One thing that is of considerable help to the mechanisation of medium and small holdings is the increasing use of electricity in agriculture; others are the adoption of pneumatic tyres and the use of light materials for agricultural machinery. In the last decade the use of electricity in agriculture has made great progress in all countries. Its extension is in conformity with the density of the population which is at a maximum in the regions where small holdings predominate. Apart from lighting, electricity is ideal for the operation of stationary machinery in agriculture, being much better suited for

this purpose than the internal combustion engine. Unlike the latter, electric motors may be constructed as small as is desired without loss of efficiency and they are very sturdy. Since a much greater proportion of work is done on the spot on medium and small farms than on large farms, electricity will grow in importance.

The use of pneumatic tyres for tractors has enabled very small tractors to be made and their application to farm carts has simplified the problem of transport to a marked degree. This is an enormous advantage for agriculture, in a way, a transport industry for at least half of the work done on farms is expended on the carriage of goods. An estimate of the advantages that would accrue were pneumatic tyres generally employed may be made on the basis that they effect a saving of 20—25 per cent. on the necessary draft.

The application of light construction to agricultural machinery has made possible the manufacture of machines of much lighter draft, and in particular does this apply to harvesting machinery. Up till now the use of harvesting machinery was restricted to large farms but the developments of the last few years have resulted in the construction of machines so much smaller and of so much lighter draft that there are now available models suitable to medium sized and small holdings.

These few examples show a marked tendency mechanisation to penetrate to the small farm.

The Manufacture of Agricultural Machinery.

The tendencies mentioned above are reflected up to a point in the statistics on the production of agricultural machinery in the United States, the country that is pre-eminent in this respect.

The mean value of the production of agricultural machines in the United States during the last ten years was 1,430,000,000 gold francs*, and thus greater than that of the rest of the world together. Germany, the second country in this respect, has, it is estimated, a production of only $\frac{1}{5}$ that of the United States and other countries follow at greater or lesser intervals.

During the years 1935 to 1938 inclusive, the mean value of agricultural machinery manufactures of the United States was a little higher than the above figure, namely 1,450,000,000 gold francs and during this period the production was divided among the different types of machines as follows. tractors 44 per cent., Internal combustion engines 3 per cent., Ploughs 3 per cent., Seed drills 1 per cent., Mowers, grain harvesters and harvester-threshers (together) 7 per cent., cream separators 1 per cent., other agricultural machinery 40 per cent.

Table I shows the number of these different machines produced in the United States in 1929-31 and 1935-38. For the period 1932-1934 there is no data because production was so reduced that statistics were not compiled. During the period 1935-38, 77 per cent. of the tractors made were described as "all purpose tractors"; these machines enjoy a growing popularity in the United

* 1 gold franc = 1 Swiss franc (former parity) = 0.2932 g fine gold.

TABLE I — *The manufacture of agricultural machinery in the United States*

Description	1927	1930	1931	1935	1936	1937	1938
Value in 1000 \$							
Tractors	227.7	205.7	75.6	147.8	214.8	268.4	196.2
including Wheel tractors	141.7	123.3	4.6	83.1	100.8	151.7	110.9
Tracklaying tractors	53.6	48	13.3	37.1	51.0	6.4	33.8
Garden tractors	0.1	1	0.6	0.8	1.1	1.6	1.3
Tractor parts *	31.5	33.0	19.1	6.5	38.3	1.7	11.2
Internal Combustion Engines *	10.1	6.2	3.0	11.2	16.0	20.8	15.4
Ploughs	39.7	34.5	11.4	9.8	15.5	19.7	16.1
Seed drills	10.0	6.5	1.4	4.1	6.4	7.0	5.9
Mowers	7.1	6.5	2.4	6.9	7.8	8.0	5.0
Grain harvesters	10.7	7.8	2.5	7.5	11.2	5.4	9.5
Harvester threshers	50.7	32.7	9.2	4.0	13.3	21.3	35.6
Threshing machines	12.2	7.0	3.0	3.6	7.1	4.0	7.4
Cream separators	7.7	4.7	2.4	4.5	3.7	3.8	2.9
Other agricultural machinery *	230.7	195.4	103.5	134.8	191.5	221.6	196.0
TOTAL *	606.6	507.0	214.4	334.2	487.3	580.0	490.0

Number in thousands

Wheel tractors	196.0	176.0	61.9	138.1	193.9	237.8	172.4
Tracklaying tractors	27.1	20.2	7.1	18.8	27.9	34.6	16.8
Garden tractors	5.9	6.2	2.7	4.3	5.9	10.7	9.9
Ploughs	703.4	538.8	183.0	401.7	479	494.1	335.9
Seed drills	70.4	46.8	11.4	32.4	47.2	57.0	41.2
Mowers	126.4	117.6	43.3	118.9	124.7	125.9	70.2
Grain harvesters	65.1	46.2	15.4	47.1	66.0	31.3	47.6
Harvester threshers	37.0	24.4	5.9	3.9	17.0	29.4	48.0
Threshing machines	13.6	8.5	3.8	4.6	8.6	5.0	8.6
Cream separators	172.2	105.6	64.4	106.0	85.7	84.2	71.5

* Quantity in figures

States where they are recognised as the most suitable prime mover for small farms operated by a family. Further it will be noticed that in 1937 44 per cent of the wheel tractors were already fitted with pneumatic tyres and that in 1938 the percentage had grown to 65 per cent and in 1939 to 83 per cent. With regard to the combine harvesters about 56 per cent of them had a width of cut of less than 6 ft in 1937 whilst this proportion grew to 59 per cent in 1938 and in 1939 to 73 per cent. These examples show that even in the United States where there are opportunities of using big machines there is also this increase in the production of smaller types.

Table II gives the estimated value of the production of agricultural machinery in the two leading countries in this respect—United States and Germany—and the proportion between their production and exports. Besides these two countries, Russia has also a considerable output of agricultural machinery which was organised between 1927 and 1931 with the aid of foreign technicians particularly Americans. It is however impossible to judge how far the results achieved correspond to the expenditure and in any case, this industry was organised just at the time when it was thought that the biggest possible machine would give the best results. It would seem that, in Russia this view is still held, the vast areas available, the existence of huge state farms and kolkhozi still make large machines advantageous and will do so until the fertility of the soil diminishes and the extension of the steppes and soil erosion leads to a change

TABLE II. — *Estimated production of agricultural machinery in the United States and in Germany*

(1,000,000 gold francs *)

Description	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	Average 1929-38
United States . .	3,140	2,630	1,110	600	500	560	1,020	1,490	1,780	1,500	1,430
exported	23 %	23 %	27 %	9 %	10 %	12 %	10 %	9 %	13 %	15 %	17 %
Germany	350	280	200	130	170	200	280	370	500	550	300
exported	34 %	34 %	29 %	22 %	17 %	14 %	11 %	11 %	11 %	10 %	18 %

* 1 gold franc — 1 Swiss franc of former parity = 0.2932 g fine gold

International Trade in Agricultural Machinery.

The high proportion of the exports of agricultural machinery from the United States and from Germany between the years 1929 and 1931 was the result of the huge deliveries made to Russia during the organisation of her own factories and when this country was buying agricultural machines from all the exporting countries because it was necessary to mechanise agriculture as far as possible during the first five year plan. This is why the world economic crisis did not noticeably affect the trade in agricultural machinery until 1932 when Russia began manufacturing her own machines and ceased buying them from abroad.

The total average annual value of the exports of agricultural machinery from different countries, in the period 1929-1938, amounted to about 460,000,000 gold francs as can be seen in Table III. This total was made up as follows: 54 per cent. (*i. e.* more than half) from the United States, 12 per cent from Germany, 8 per cent. from the United Kingdom, 6 per cent. from Canada, 3 per cent. from France, 8 per cent. from Ireland, Austria, Czechoslovakia, and Hungary taken together and 4 per cent. from the rest of the world.

The imports were spread over a very large number of countries namely, Russia 15 per cent., Canada 11 per cent., Argentina 7 per cent., Union of South Africa, Australia, United States, United Kingdom, and France 4 per cent. each New Zealand, the Netherlands, Algeria, Italy and Germany 2 per cent. each and the rest of the world about 37 per cent.

In the international trade in agricultural machinery tractors take the first place with an annual value of 190,000,000 gold francs or about 40 per cent. of the whole trade. Table IV shows the value of the international trade in tractors and it will be noticed that 80 per cent. is due to America with annual exports worth 151,000,000 gold francs. The important part that Ireland played in this trade was due to the Fordson Factory at Cork in 1930 but later, when this firm moved to England, Ireland lost its importance in this branch of international trade. The remarks made above on Russia applies with special force to the imports of tractors; in 1931 this country took 26 per cent. of the total world imports of tractors whilst since 1934 her imports have dwindled almost to nil.

TABLE III — *International trade in agricultural machinery*

(1 000 000 gold francs)

Countries	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	Average 1929-38
<i>Exports</i>											
United States	729.8	600.2	297.5	54.7	50.9	66.5	98.6	134.7	230.6	230.9	249.1
Germany	120.2	94.7	58.3	29.4	28.4	27.2	30.4	41.4	55.6	59.3	54.5
United Kingdom	49.9	56.7	32.1	21.6	25.8	25.8	27.9	33.4	44.0	32.7	35.0
Canada	103.1	53.7	14.6	7.0	5.6	10.2	18.2	18.4	30.1	23.8	28.5
Sweden	47.4	39.6	29.0	14.1	13.6	14.3	16.3	20.9	24.5	20.7	24.0
France	38.4	31.3	17.8	11.0	10.3	9.3	8.1	6.7	8.3	7.5	14.9
Ireland	45.8	64.6	11.9	7.1	0.7	0.2	0.2	0.2	0.2	0.2	13.1
Austria	23.2	14.6	8.9	4.3	4.6	6.0	6.2	6.6	7.5	7.6	9.0
Czechoslovakia	20.1	13.3	7.8	2.9	1.6	1.5	1.5	5.5	11.8	16.5	8.3
Hungary	14.8	7.3	3.1	1.0	1.7	2.2	2.8	3.1	3.3	3.8	4.3
Belgium	6.8	6.2	3.4	1.8	2.0	2.1	2.0	2.2	2.3	2.1	3.3
Denmark	5.4	4.6	3.0	2.2	2.3	2.6	3.1	3.4	3.3		3.2
U. S. S. R.	1.6	2.6	5.5	5.1	2.0	1.6	1.7	2.4	3.0	2.9	2.8
Other countries *	25.0	20.0	11.0	4.0	3.0	4.0	5.0	6.0	9.0	9.0	9.6
TOTAL	1 231.5	1 009.3	503.9	166.2	152.5	173.7	222.0	284.9	433.5	416.8	460.6
<i>Imports</i>											
U. S. S. R.	155.7	271.4	260.1	1.6	6.6	0.4	0.4	0.5	0.2	0.2	69.7
Canada	165.7	114.4	20.2	10.2	8.8	10.1	16.9	28.9	53.0	62.5	49.0
Argentina	135.9	66.1	8.0	2.9	3.8	6.9	15.3	13.5	31.6	46.4	33.0
Union of South Africa	45.5	23.2	13.3	10.3	8.1	16.2	18.1	18.6	22.5	20.2	19.6
Australia	48.8	40.4	11.8	3.2	4.6	4.5	7.8	15.5	21.8	31.7	19.0
United States	49.5	44.3	16.9	5.1	4.4	5.9	14.1	14.9	21.5	12.0	18.9
United Kingdom	19.3	21.6	24.5	11.7	7.3	9.3	14.3	18.4	23.2	20.6	17.0
France	27.8	32.7	30.5	16.5	14.0	8.9	5.9	7.8	11.5	9.9	16.6
New Zealand	16.1	18.8	10.2	6.8	9.7	10.8	6.9	10.4	14.5	15.2	11.9
Netherlands	11.9	13.0	10.6	7.2	7.6	7.6	8.2	8.1	8.7	8.2	9.1
Algeria	26.7	15.7	9.6	6.3	6.8	5.1	2.2	2.7	4.4	4.0	8.4
Germany	20.7	15.7	9.4	6.2	6.2	5.5	3.7	3.9	3.3	2.5	7.7
Italy	16.1	14.6	3.6	4.4	3.7	4.9	6.9	5.3	6.2	6.0	7.2
Belgium	10.9	9.1	8.2	4.2	4.7	4.8	3.8	5.0	5.8	6.0	6.3
Sweden	6.7	7.6	5.4	1.9	1.7	2.6	4.1	5.5	10.5	13.0	5.9
Denmark	11.6	15.3	8.2	2.0	1.5	2.3	2.6	3.9	3.7		5.7
Ireland	21.0	10.6	5.1	1.8	1.7	1.8	2.4	2.9	4.0	5.0	5.6
Romania	18.2	8.3	2.8	1.7	2.6	3.6	2.9	2.7	5.6	7.0	5.5
Spain	17.7	12.9	6.5	2.8	3.2	3.9	4.5				5.2
Ireland	10.1	9.9	8.1	3.5	1.8	2.0	2.8	3.7	4.3	3.7	5.0
Czechoslovakia	9.9	7.4	4.1	2.2	2.1	1.5	1.6	2.2	2.7	4.0	3.8
Switzerland	5.5	5.9	5.4	4.4	2.9	2.7	2.5	2.1	2.3	1.9	3.6
Other countries *	—	—	—	—	—	—	—	—	—	—	126.2
TOTAL	—	—	—	—	—	—	—	—	—	—	460.0

* Calculated

Tables V-X give data on the imports and exports of the countries that have any considerable trade in ploughs, seed drills, mowers, reapers, harvester-threshers, threshing machines, and cream separators. A growth in the trade in harvester-threshers is to be noticed whilst the trade in threshing machines remains fairly constant.

In a general way it must be acknowledged that the importance of international trade in agricultural machinery has decreased from its maximum in 1929 (more than 1,200,000,000 gold francs) to a minimum in 1933 (150 000,000 gold francs), then increased, little by little to 430 millions in 1937, in 1938 there was again a change of trend.

TABLE IV — *International trade in tractors*

(1 000,000 gold francs)

Countries	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	Average 1929-38
<i>Exports</i>											
United States	389.9	372.6	196.7	26.4	26.0	36.8	57.2	88.0	161.8	157.4	151.3
Ireland	45.4	64.2	11.6	7.0	0.6	0.1	0.2	0.1	0.1	0.0	12.9
Germany	16.7	9.9	6.9	5.3	5.0	4.1	5.0	7.8	13.1	17.2	9.1
United Kingdom	5.9	10.6	3.0	0.8	2.7	2.2	6.3	9.2	15.7	9.3	6.6
Czechoslovakia	0.8	1.9	0.9	0.3	0.1	—	—	3.5	8.4	12.3	2.9
France	8.6	4.8	2.7	1.8	1.1	1.1	0.9	0.7	1.2	0.4	2.3
Hungary	2.3	1.5	1.1	0.4	0.8	0.9	1.2	1.5	1.2	0.9	1.7
<i>Imports</i>											
U.S.S.R.	92.9	190.9	212.4	1.0	6.4	0.3	0.3	0.1	0.1	—	50.4
Canada	87.0	55.6	6.8	3.2	2.9	4.2	10.2	19.9	41.1	45.1	23.0
Australia	29.2	24.8	5.7	0.4	0.8	1.9	4.6	11.8	17.8	26.8	12.4
France	8.0	10.6	12.3	7.7	5.3	3.4	2.4	4.7	6.9	6.5	6.8
United Kingdom	6.3	6.9	8.4	5.8	2.9	3.8	6.0	6.7	10.5	9.5	6.7
Argentina	16.6	8.8	0.7	—	—	0.1	0.3	2.3	10.7	16.1	5.6
Union of South Africa	13.4	4.1	1.4	0.8	0.8	2.7	3.1	3.3	3.7	5.9	3.9
New Zealand	5.9	3.7	0.6	0.2	0.3	1.2	2.3	4.7	8.9	9.7	3.8
Algeria	12.8	5.7	3.3	2.4	2.0	2.1	0.7	1.6	2.4	2.2	3.5
Sweden	1.9	2.1	1.4	0.7	0.4	0.8	1.8	3.0	6.4	8.3	2.7
Italy	—	3.5	2.5	1.3	2.9	3.5	2.1	1.5	2.0	1.7	2.3
United States	—	0.1	6.5	0.1	0.1	0.5	2.3	3.5	4.2	0.9	2.0
Spain	3.2	2.7	1.1	0.6	1.0	1.3	1.3	—	—	—	1.6
Netherlands	—	1.1	1.1	1.0	0.6	0.8	1.2	1.0	1.2	1.4	1.1

TABLE V — *Exports and imports of ploughs*

(1 000,000 gold francs)

Countries	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	Average 1929-38
<i>Exports</i>											
United States	42.3	31.6	7.2	1.9	1.7	2.9	3.9	5.1	8.8	8.2	11.4
Germany	19.1	16.2	6.6	2.7	2.8	3.2	3.8	5.6	8.3	8.3	7.7
Canada	25.0	12.3	1.8	1.1	1.0	2.2	3.6	4.6	8.4	5.2	6.6
United Kingdom	10.9	7.4	3.4	2.7	3.9	4.0	2.8	3.0	3.6	3.1	4.5
<i>Imports</i>											
Argentina	27.5	18.2	2.3	1.1	1.7	2.4	3.4	2.9	4.8	4.6	6.9
Union of South Africa	14.3	7.0	4.2	3.6	3.1	5.2	5.9	6.8	8.6	7.3	6.6

TABLE VI — *Exports of seed drills*

(1 000 000 gold francs)

Countries	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	Average 1929-38
United States	13.7	6.7	1.1	0.3	0.2	0.4	0.5	1.2	3.1	3.8	3.1
Germany	7.3	4.3	1.0	0.3	0.7	0.7	0.6	0.7	1.1	1.4	0.8
Canada	5.1	2.6	0.4	0.3	0.1	0.4	0.7	0.9	1.7	0.8	1.3
Czechoslovakia	4.9	2.4	0.8	0.4	0.5	0.4	0.3	0.5	0.8	1.1	1.2

TABLE VII. — *Exports and imports of scythes and sickles.*

(1,000,000 gold francs)

Countries	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	Average 1929-38
<i>Exports</i>											
Austria	8.5	6.7	5.4	2.8	3.0	4.2	4.4	5.0	5.4	5.5	5.1
<i>Imports</i>											
Italy	1.6	1.5	1.3	0.9	0.9	1.1	0.9	0.9	0.8	0.9	1.1
Poland	1.9	1.3	0.9	0.4	0.4	0.6	1.0	1.1	1.4	1.4	1.0
Czechoslovakia	1.4	1.4	1.0	0.7	0.9	0.8	0.6	0.8	0.9	0.8	0.9

TABLE VIII. — *Exports and imports of mowers, grain harvesters and harvester-threshers.*

(1,000,000 gold francs)

Countries	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	Average 1929-38
<i>Exports</i>											
United States	106.6	64.4	36.7	4.1	3.3	3.2	7.6	3.7	10.3	19.5	25.9
Including: combines	80.5	46.8	32.3	2.5	2.0	1.9	5.0	2.3	6.1	14.6	19.4
Germany	14.5	14.2	11.2	4.4	3.3	3.6	4.0	6.1	7.7	10.1	7.9
Canada	35.3	14.0	3.4	1.3	0.6	2.2	4.2	3.7	5.6	7.3	7.8
Including: combines	18.3	2.5	0.9	0.5	—	1.0	1.7	1.5	2.6	4.6	3.4
Sweden	5.9	4.1	3.9	1.3	1.4	2.1	2.4	3.2	4.0	3.6	3.2
United Kingdom	4.6	3.6	2.6	1.7	1.3	1.5	1.7	3.1	3.3	3.0	2.6
<i>Imports</i>											
Argentina	65.3	15.8	1.2	0.5	—	2.2	6.6	3.1	7.2	14.7	11.7
Including: combines	25.5	12.3	0.9	0.5	—	2.1	6.2	2.5	6.1	13.0	6.9
Denmark	5.0	7.3	3.9	0.9	0.7	1.3	1.7	2.8	2.3	...	2.9
Italy	5.3	6.0	3.0	1.9	1.9	2.1	1.6	1.4	1.6	1.3	2.6
United Kingdom	3.0	2.9	3.6	1.7	0.9	1.3	2.3	3.2	3.4	3.2	2.6
Netherlands	1.9	2.9	2.8	1.6	1.7	1.8	1.7	1.9	2.2	1.9	2.0
Spain	4.9	3.0	1.7	0.2	0.6	0.8	1.5	...	...	...	1.8

TABLE IX. — *Exports and imports of threshing machines*

(1,000,000 gold francs)

Countries	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	Average 1929-38
<i>Exports</i>											
United States	13.3	7.7	1.1	0.5	0.5	0.6	0.6	1.7	1.6	2.8	3.0
Germany	7.1	4.2	2.6	1.2	1.6	1.8	1.7	1.6	1.9	1.6	2.5
United Kingdom	7.2	4.8	4.0	1.2	1.1	1.4	1.3	1.1	0.8	0.7	2.4
Hungary	9.4	3.7	1.2	0.4	0.6	0.9	1.0	0.8	1.4	1.6	2.1
Canada	3.0	2.2	1.1	0.7	0.1	0.4	1.7	1.0	2.0	0.9	1.3
<i>Imports</i>											
Canada	11.5	5.2	3.6	0.3	0.3	0.2	0.1	0.8	0.6	1.8	2.4
U. S. S. R.	3.8	14.7	0.5	—	—	0.1	0.1	—	—	—	1.9
Spain	5.1	4.0	0.7	0.4	0.4	0.4	0.4	...	...	...	1.6
Italy	1.4	1.2	0.9	0.8	1.1	1.1	1.0	0.4	0.6	0.7	0.9
Netherlands	1.0	1.1	1.0	0.6	1.1	3.1	1.2	0.8	0.6	0.4	0.9

TABLE X — *Exports and imports of cream separators*

(1 000 000 gold francs)

Countries	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	Average 1929-38
<i>Exports</i>											
Sweden	25.1	24.5	18.1	10.0	9.9	9.3	9.8	12.4	13.6	10.3	14.3
Germany	5.5	3.4	2.1	1.5	1.4	1.3	1.4	2.0	2.5	2.1	2.3
United States	3.6	4.6	2.6	1.9	1.4	0.6	0.2	0.3	0.2	0.2	1.6
Belgium	3.2	2.8	1.3	0.7	0.8	1.0	0.9	1.0	0.9	0.7	1.3
United Kingdom	1.1	0.6	0.6	1.2	1.4	1.6	1.3	1.4	1.6	1.1	1.7
Finland	2.1	1.6	1.0	0.4	0.3	0.4	0.7	0.7	0.8	0.7	0.9
<i>Imports</i>											
Turkey	2.4	4.6	4.1	1.8	3.2	1.8	1.9	1.5	2.4	1.7	2.5
Germany	3.1	3.7	2.9	2.3	2.3	2.1	1.4	1.7	1.9	1.7	2.3
Canada	4.1	6.4	2.5	1.4	1.6	1.3	0.9	1.3	1.7	1.5	2.3
Australia	3.8	3.5	2.7	2.1	2.5	1.2	1.3	1.5	1.7	1.4	2.3
New Zealand	1.6	2.3	1.2	2.4	1.3	1.2	1.0	1.3	0.9	0.5	1.4
United States	4.4	1.5	0.4	0.2	0.6	0.7	1.4	1.6	1.4	1.3	1.4

The graph of the values of this trade does not coincide with the graph of the quantities handled. This reached its minimum in 1932 whilst it rose in 1933 and continued to do so until 1937-38. During recent years the quantities handled have increased more rapidly than the corresponding value that is to say that by comparison with 1929 the price of agricultural machinery expressed in gold francs has fallen.

This fall in price acquires a greater significance when it is remembered that in general the quality of the machines has improved in many cases by the application of new constructional methods which have made it possible to reduce the weight of the machines and at the same time make them stronger.

In support of this statement the foreign trade in agricultural machinery of the principal importing and exporting countries is shown in Tables XI-XXIII where the countries are listed in order of the volume of their trade and the values are given in terms of the currency of the country in question.

Finally, in Table XXIV is given the value of the exports of agricultural machinery from the United States to the various importing countries. This shows that, in the course of the years discussed, the foreign trade of the United States has tended to become more firmly established in North and South America, South Africa and Australia whilst it has lost some of its importance in Eastern Europe.

However, the important importing countries (Canada, Argentina, South Africa and Australia) are also good customers of other countries besides the United States, namely Germany and Great Britain. The latter is extending its external trade, especially in other countries of the British Empire, whilst Germany is endeavouring to strengthen her position with her western and southern neighbours and even more particularly in the South East.

TABLE XI — *United States exports and imports of agricultural machinery*

Description	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
Value in 1000 \$										
EXPORTS										
Windmills	2 743	1 451	441	218	337	637	685	1 076	1 363	1 035
Wheel tractors	49 108	44 188	26 981	1 485	1 815	3 834	7 102	11 870	23 519	23 324
Tracklaying tractors	12 665	13 084	4 146	1 546	2 104	4 620	6 713	11 148	20 686	18 628
Tractor parts	13 451	14 616	6 822	2 064	2 332	3 472	4 794	5 732	8 654	9 469
Ploughs	8 169	6 096	1 397	370	400	948	1 252	1 679	2 881	2 683
Other cultivating implements *	10 153	6 680	2 460	1 072	1 274	2 047	2 492	3 108	4 799	3 772
Seed drills	2 651	1 290	221	57	41	144	165	393	1 007	1 226
Planters	494	977	569	32	54	151	291	412	615	586
Spraying, dusting, and machines *	335	479	367	226	163	279	404	493	743	702
Lawn mowers	863	580	138	74	51	186	319	445	649	526
Mowers	848	557	332	142	137	201	226	296	371	383
Grain harvesters	4 180	2 821	718	225	253	230	517	470	714	1 070
Harvester threshers	15 536	9 024	6 237	480	473	627	1 633	745	1 987	4 777
Threshing machines	2 560	1 482	218	101	119	180	188	552	537	925
Feed cutters, crushers and grinders	427	361	199	147	90	257	214	753	304	387
Incubators and brooders	879	868	292	82	53	95	111	187	173	104
Cream separators	700	879	508	361	334	200	80	93	79	73
Other farm machinery *	1 769	1 336	666	374	322	622	795	972	720	409
Other agricultural machinery *	13 270	9 040	4 691	1 492	1 863	2 813	4 059	4 001	5 528	5 363
TOTAL *	140 801	115 809	57 403	10 548	12 215	21 543	32 040	43 985	75 331	75 442
IMPORTS										
Tractors	—	14	1 259	11	34	151	756	1 154	1 379	294
Plowing and cultivating implements	364	353	129	39	129	120	188	226	337	325
Grain harvesters and harvester threshers	877	53	100	20	3	20	793	274	567	981
Cream separators	849	292	74	36	146	237	44	509	475	415
Other agricultural machinery *	7 454	7 833	1 705	883	750	1 393	2 919	2 692	4 277	1 905
TOTAL *	9 544	8 545	3 267	989	1 062	1 921	4 598	4 855	7 035	3 920
Number										
EXPORTS										
Windmills	32 492	13 657	4 694	2 465	3 927	7 679	8 562	14 081	16 972	12 498
Wheel tractors	54 353	44 774	27 079	1 629	2 403	5 330	8 741	14 355	30 176	30 459
Tracklaying tractors	6 490	5 366	1 750	889	1 198	2 393	3 144	5 526	10 078	8 922
Ploughs	244 882	157 269	53 433	15 164	30 636	68 341	99 352	95 754	116 810	65 034
Seed drills	24 424	16 355	1 703	553	988	2 212	2 630	3 747	10 219	8 817
Planters	11 706	24 162	5 046	623	1 730	6 133	9 531	13 310	15 691	12 503
Lawn mowers	103 167	77 685	40 576	15 449	20 614	30 560	34 433	44 073	53 332	44 539
Mowers	13 400	9 218	2 026	1 037	778	2 788	4 537	6 414	9 572	6 520
Grain harvesters	21 337	14 630	4 055	1 389	1 425	1 336	2 95	5 217	4 035	4 209
Harvester threshers	10 887	6 573	2 608	382	405	500	1 256	608	1 780	4 071
Threshing machines	2 806	1 414	214	123	134	182	222	584	601	987
Feed cutters, crushers and grinders	8 554	5 875	3 212	1 988	2 266	3 245	3 423	2 895	4 064	3 991
Incubators and brooders	30 757	26 934	9 768	2 642	1 429	2 017	3 369	3 654	3 906	3 348
Cream separators	12 420	14 596	9 062	6 992	5 850	3 335	1 350	1 749	1 845	1 479
IMPORTS										
Tractors	—	28	2 098	18	69	364	1 556	2 374	2 562	701
Plowing and cultivating implements	3 455	4 416	1 435	525	613	1 729	2 706	4 684	2 962	3 339
Grain harvesters and harvester threshers	1 153	149	123	37	14	62	856	723	1 788	2 137
Cream separators	41 835	15 182	4 624	2 045	7 508	11 597	21 801	23 780	73 945	19 450

* Quantity not given

TABLE XII. — *Germany, exports and imports of agricultural machinery.*

Description	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
<i>Value in 1000 RM</i>										
EXPORTS										
Tractors	14,324	8,043	5,609	4,337	4,106	3,306	4,054	6,217	10,602	13,927
Ploughs	15,478	13,080	5,380	2,218	2,254	2,562	3,058	4,498	6,737	6,702
Other cultivating implements	7,843	4,005	1,542	875	935	827	928	1,150	1,482	1,555
Seed drills	5,917	3,475	847	249	582	596	443	589	930	1,123
Choppers, scythes and sickles	5,915	4,130	2,569	2,156	2,757	2,145	3,482	4,322	4,851	3,181
Mowers and grain harvesters	11,742	11,473	9,058	3,590	2,651	2,942	3,239	4,943	6,196	8,169
Threshing machines	5,789	3,408	2,088	963	1,329	1,469	1,400	1,300	1,507	1,308
Grain cleaners	3,778	2,312	1,471	762	800	821	912	922	1,548	1,782
Hay and straw presses and pneumatic conveyers	848	883	839	402	649	751	487	698	747	571
Feed cutters, crushers and grinders	1,414	1,190	743	288	237	195	154	134	173	259
Cream separators	4,462	2,762	1,697	1,186	1,100	1,037	1,119	1,634	2,025	1,710
Other dairy machinery	1,761	1,539	1,012	572	499	360	268	498	533	455
Other agricultural machinery	18,059	20,414	14,785	6,220	5,109	5,298	5,038	6,611	7,726	7,833
TOTAL	97,330	76,714	47,640	23,818	23,008	22,308	24,582	33,516	45,057	48,035
IMPORTS										
Tractors	4,872	2,731	1,648	864	397	371	156	179	21	23
Cream separators	2,526	3,010	2,317	1,880	1,880	1,715	1,145	1,362	1,535	1,388
Other agricultural machinery	9,376	6,987	3,733	2,295	2,739	2,397	1,647	1,645	1,089	639
TOTAL	16,774	12,728	7,698	5,039	5,016	4,483	2,948	3,186	2,645	2,046
<i>Metric tons</i>										
EXPORTS										
Tractors	6,872	3,646	2,642	2,357	2,598	2,347	3,580	5,521	9,173	11,520
Ploughs	21,638	18,700	8,122	3,736	4,318	5,420	6,808	9,953	15,490	13,525
Other cultivating implements	12,514	6,022	2,245	1,246	1,355	1,433	1,913	2,431	3,324	3,225
Seed drills	7,040	4,509	1,096	322	882	1,010	746	1,130	1,707	1,950
Choppers, scythes and sickles	4,075	3,179	1,766	1,778	2,645	2,138	3,900	4,656	5,424	2,574
Mowers and grain harvesters	16,597	16,094	13,731	5,350	4,199	4,819	5,404	9,154	11,567	14,599
Threshing machines	5,342	3,459	2,255	1,313	2,006	2,296	2,284	2,195	2,391	1,980
Grain cleaners	2,161	1,389	806	472	551	591	680	711	1,152	1,291
Hay and straw presses and pneumatic conveyers	967	1,014	948	473	772	989	673	1,002	1,123	833
Feed cutters, crushers and grinders	1,824	1,573	1,012	366	302	279	222	178	214	295
Cream separators	1,178	678	428	318	341	331	370	549	717	560
Other dairy machinery	852	704	459	271	278	225	171	294	327	236
Other agricultural machinery	14,599	19,377	15,275	5,167	4,345	4,627	4,839	6,689	8,552	7,855
TOTAL	95,659	80,344	50,785	23,169	24,592	26,505	31,590	44,464	61,161	60,443
IMPORTS										
Tractors	2,768	1,384	584	347	238	316	90	94	9	8
Cream separators	827	885	705	653	699	600	378	412	434	416
Other agricultural machinery	8,805	6,398	3,330	1,985	2,572	2,429	1,515	1,332	812	434
TOTAL	12,400	8,667	4,619	2,985	3,509	3,345	1,983	1,838	1,255	858

TABLE XIII — *United Kingdom, exports and imports of agricultural machinery*

Description	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
<i>Value in 1000 £</i>										
EXPORTS										
Tractors	232.5	420.4	125.9	45.1	156.5	143.7	416.1	601.7	1036.0	621.5
Ploughs	430.8	292.3	145.7	150.7	230.1	256.8	187.2	198.6	238.1	207.1
Forks*		62.6	48.2	51.4	50.5	55.5	58.4	58.9	73.5	67.6
Scythes, sickles and similar tools*		466.0	291.9	408.9	545.7	535.4	485.6	510.2	647.1	458.1
Lawn and grass mowers	198.7	170.3	129.7	115.0	103.2	122.8	120.4	145.5	181.6	171.8
Grain harvesters	50.1	35.3	20.6	20.6	22.2	23.3	41.4	55.2	38.5	29.0
Threshing machines	285.6	190.3	169.7	68.0	67.0	91.2	89.0	69.5	52.8	48.7
Sheep shears and similar machines	201.8	105.8	63.1	54.2	39.6	70.6	76.0	98.4	128.3	97.9
Cream separators	44.0	24.4	24.9	68.1	80.8	100.5	84.3	93.7	106.6	76.3
Other dairy machinery	62.1	49.6	33.5	49.1	56.7	62.0	75.1	101.8	122.5	158.6
Other agricultural machinery	471.9	430.2	311.7	166.4	149.0	196.4	215.9	254.0	282.9	249.1
TOTAL	1977.5	2247.2	1364.9	1197.5	1501.3	1658.1	1849.4	2187.5	2907.9	2185.7
IMPORTS										
Tractors	250.0	275.2	356.4	320.8	166.9	243.1	395.4	442.0	717.4	637.2
Ploughs	36.7	32.0	35.7	27.6	35.6	39.6	59.7	86.9	118.8	89.4
Lawn and grass mowers	89.3	100.4	168.8	59.2	13.9	21.2	45.0	60.0	61.6	79.2
Grain harvesters	75.5	67.2	67.4	40.8	39.7	64.2	106.7	151.7	163.6	136.6
Cream separator	66.1	67.0	65.1	25.9	18.3	26.5	28.4	37.4	22.7	20.3
Other dairy machinery	118.3	118.8	143.0	85.2	63.5	111.6	180.5	264.9	219.7	204.8
Other agricultural machinery	129.8	197.7	205.5	89.0	86.5	92.7	132.0	168.8	229.8	207.7
TOTAL	756.7	858.3	1041.9	648.5	424.4	598.9	947.7	1205.7	1533.6	1375.2
RE-EXPORTS	94.4	80.1	81.7	25.6	22.0	30.6	39.4	51.6	61.9	49.7
<i>Metric tons</i>										
EXPORTS										
Tractors	3025	6584	1490	535	1533	1736	6628	10312	18112	10173
Ploughs	7040	4330	2852	2898	3461	3885	5383	3790	4421	3735
Lawn and grass mowers	1884	1787	1198	1100	935	1150	1140	1340	1510	1229
Grain harvesters	873	627	432	376	373	392	778	1026	686	462
Threshing machines	3906	2665	2813	974	1039	1310	1186	852	635	568
Sheep shears and similar machines	539	258	68	73	71	127	179	194	289	194
Cream separators	207	107	108	327	415	467	360	435	50	313
Other dairy machinery	312	229	117	184	235	281	240	376	361	525
Other agricultural machinery	7110	5695	3778	2068	2016	2724	3180	3667	4300	3305
TOTAL	24896	22282	12856	8535	10078	12072	17074	21982	30764	20504
IMPORTS										
Tractors	2892	3571	4117	4232	2053	3400	5159	5129	8239	6931
Ploughs	842	660	722	508	638	768	1129	1633	2443	1575
Lawn and grass mowers	1651	2043	3775	945	189	425	1002	1198	1179	1543
Grain harvesters	1182	1091	1077	529	607	1124	1861	2561	2865	2423
Cream separators	378	404	381	99	58	99	97	113	79	62
Other dairy machinery	585	619	752	414	234	539	824	1033	718	609
Other agricultural machinery	1871	2280	1843	815	943	1158	1929	2365	3446	2796
TOTAL	9401	10668	12667	7542	4722	7513	12001	14029	18969	15939
RE-EXPORTS	914	900	948	173	140	226	320	550	717	493

* Quantity not given

TABLE XIV. — *Canada, exports and imports of agricultural machinery.*

Description	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
<i>Value in 1000 \$</i>										
EXPORTS:										
Ploughs *	4,821	2,370	355	239	255	689	1,162	1,510	2,729	1,707
Other cultivating implements *	1,236	705	191	58	81	173	388	348	583	475
Seed drills	981	504	82	69	33	114	225	301	570	258
Mowers	788	525	169	43	24	115	263	198	197	231
Grain harvesters	2,485	1,701	329	136	131	282	640	706	987	881
Harvester-threshers	3,533	482	179	117	11	310	549	479	842	1,505
Threshing machines	572	430	228	144	39	123	577	328	656	292
Cream separators *	55	23	19	4	34	42	66	98	69	57
Other dairy machinery *	697	342	105	39	24	69	96	189	293	218
Other agricultural machinery *	4,713	3,271	1,260	692	851	1,362	1,973	1,865	2,956	2,209
TOTAL *	19,881	10,353	2,917	1,541	1,483	3,279	5,939	6,022	9,882	7,833
IMPORTS:										
Tractors	16,790	10,735	1,352	708	775	1,339	3,346	6,494	13,433	14,819
Ploughs *	2,229	1,798	44	45	10	41	59	226	573	609
Other cultivating implements *	1,080	848	110	30	30	68	104	159	273	408
Seed drills	987	654	56	7	12	26	33	108	165	233
Spraying and dusting machines *	231	182	121	48	32	53	59	118	205	226
Mowers	102	94	22	13	16	26	49	76	86	118
Grain harvesters	5,038	1,654	53	96	74	68	177	216	347	777
Harvester-threshers	—	2,215	14	5	—	2	2	184	257	842
Threshing machines	2,795	999	71	62	71	59	18	264	198	595
Feed cutters, crushers and grinders	136	150	48	75	39	113	68	85	132	170
Cream separators	793	1,244	504	306	422	409	296	413	561	490
Other dairy machinery *	232	209	217	100	83	113	164	186	272	313
Other agricultural machinery *	1,566	1,295	1,431	749	751	923	1,154	909	815	820
TOTAL *	31,978	22,077	4,043	2,244	2,315	3,240	5,529	9,438	17,317	20,420
RE-EXPORTS *	283	134	121	71	42	94	559	76	161	82
<i>Number</i>										
EXPORTS:										
Seed drills	5,945	3,204	603	493	192	854	1,722	2,120	4,030	1,828
Mowers	13,142	8,559	3,120	826	416	1,929	4,310	3,213	2,870	2,821
Grain harvesters	14,741	8,895	1,752	724	823	1,681	3,580	3,881	5,335	4,084
Harvester-threshers	3,263	377	174	192	11	288	624	445	960	1,639
IMPORTS:										
Tractors	16,973	11,223	757	150	179	499	2,244	5,222	12,404	15,038
Seed drills	6,327	4,305	1,121	531	1,020	2,642	...	...	...	...
Mowers	871	866	314	110	244	471	792	803	826	977
Grain harvesters	5,468	3,197	272	452	400	448	1,318	656	1,233	2,654
Harvester-threshers	—	1,524	13	1	—	1	2	92	189	702
Threshing machines	1,988	877	54	44	68	36	14	176	121	580
Feed cutters, crushers and grinders	1,242	1,244	388	888	440	1,076	352	745	538	930
Cream separators	18,269	26,407	12,476	7,358	9,560	12,305	11,299	17,077	22,920	18,049

* Quantity not given.

TABLE XV — *Sweden, exports and imports of agricultural machinery*

Description	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
<i>Value in 1000 kr</i>										
EXPORTS										
Tractors	3 628	1 541	317	155	180	198	981	968	800	521
Tilling and cultivating implements	314	225	84	100	101	139	136	206	380	485
Seed drills	881	362	231	112	163	256	412	426	786	601
Mowers	3 556	2 551	2 780	1 337	1 489	2 464	2 625	3 417	4 221	3 827
Grain harvesters	679	367	192	34	94	191	52	689	920	826
Threshing machines	1 178	912	490	160	185	251	450	732	1 087	1 333
Milking machines	1 358	1 532	1 776	578	217	436	748	1 582	2 072	2 594
Cream separators	18 065	17 665	13 805	10 419	11 070	11 541	12 580	15 737	17 442	13 400
Other dairy machinery	869	930	741	488	334	443	529	671	646	713
Other agricultural machinery	3 624	2 410	1 717	1 286	1 364	1 839	2 051	2 223	3 057	2 476
TOTAL	34 152	28 495	22 133	14 669	15 197	17 758	21 014	26 646	31 461	26 785
IMPORTS										
Tractors	1 342	1 518	1 109	706	412	1 047	2 307	3 810	8 210	10 763
Tilling and cultivating implements	566	537	328	106	103	175	301	530	1 181	1 427
Mowers and grain harvesters	1 193	1 304	958	121	313	560	562	478	670	617
Cream separators	95	141	69	65	58	102	154	142	200	174
Other dairy machinery	292	294	286	223	316	411	526	443	858	981
Other agricultural machinery	1 310	1 827	1 407	767	651	983	1 478	1 548	2 398	2 223
TOTAL	4 798	5 621	4 157	1 988	1 853	3 278	5 328	6 951	13 517	16 885
<i>Metric tons</i>										
EXPORTS										
Tractors	1 965	806	142	76	83	82	217	288	330	178
Tilling and cultivating implements	463	310	128	137	145	193	184	241	410	478
Seed drills	1 095	446	271	105	182	308	544	541	989	652
Mowers	5 446	4 075	4 485	1 891	2 269	3 697	4 317	5 444	6 748	5 340
Grain harvesters	956	513	276	49	129	260	639	869	1 104	899
Threshing machines	1 066	802	426	142	172	239	424	759	1 037	1 184
Milking machines	200	220	249	71	28	57	105	198	247	290
Cream separators	5 258	4 834	3 718	2 733	2 842	2 752	3 053	3 851	4 244	3 164
Other dairy machinery	274	291	207	90	88	101	120	157	152	137
Other agricultural machinery	4 469	2 895	1 954	1 122	1 379	1 780	2 240	2 621	3 553	2 534
TOTAL	21 192	15 192	11 855	6 416	7 317	9 472	11 843	14 969	18 814	14 856
IMPORTS										
Tractors	890	1 019	728	398	255	716	1 735	2 833	5 697	6 840
Tilling and cultivating implements	714	683	423	86	98	205	286	550	1 147	1 265
Mowers and grain harvesters	1 422	1 530	1 185	113	348	567	536	504	708	556
Cream separators	41	49	26	25	23	38	57	45	56	45
Other dairy machinery	147	115	123	77	108	129	146	141	165	183
Other agricultural machinery	1 268	2 651	1 778	593	559	941	1 402	1 562	2 514	2 147
TOTAL	4 482	6 047	4 263	1 292	1 391	2 596	4 162	5 635	10 287	11 034

TABLE XVI. — *France, exports and imports of agricultural machinery.*

Description	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
<i>Value in 1000 frs</i>										
EXPORTS										
Tractors	42,190	23 460	13,375	8,930	5,412	5,234	4,370	3,788	9,290	4,753
Tilling and cultivating implements	11,971	17,551	10,876	4,408	3,123	2,888	2,148	2,737	4,970	8,263
Spades, picks and shovels	9,681	8,820	4,674	3,285	3,508	3,054	2,665	2,869	6,199	8,320
Scythes and sickles	2,823	2,726	1,657	1,371	1,453	1,244	1,322	1,156	1,898	2,190
Mowers	6,101	8,044	5,170	2,342	2,268	2,061	2,701	1,708	2,658	5 387
Grain harvesters	5,390	10,131	2,988	2,976	3,542	3,428	5,590	2,418	4,537	6,200
Oil and wine presses	8 232	8,088	5,312	2,225	4,505	2,571	580	1,600	3,405	2,867
Other agricultural machinery	102,702	75,386	43,617	28,656	27,248	25,266	20,374	19,492	33,895	46,924
TOTAL	189,090	154,206	87,669	54,193	51,059	45,746	39,750	35,768	66,852	84,904
IMPORTS										
Tractors	39,340	53,579	60,540	37,963	26,129	16,589	12,324	25,171	56,046	74,096
Tilling and cultivating implements	5,877	4,686	4,568	1,793	1,042	775	417	983	3,155	2,785
Mowers	10,030	8,378	7,791	3,947	1,816	1,882	1,290	1,162	1,724	2,571
Grain harvesters	28,447	24,824	16,296	4,561	2,473	1,806	941	1,092	2,199	2,480
Cream separators and similar machinery	11,770	22,684	20,048	8,626	15,969	8,967	9,396	8,018	19,672	18,872
Other agricultural machinery	42,659	47,012	41,291	24,175	19,686	14,882	4,758	5,295	10,088	12,237
TOTAL	138,123	161,163	150 534	81,065	69 115	44 901	29 126	41,721	92,884	113,041
<i>Metric tons</i>										
EXPORTS										
Tractors	2,862	1,841	915	707	397	501	343	339	381	250
Tilling and cultivating implements	1,050	4,919	2,795	1,118	816	843	724	907	1,255	1,705
Spades, picks and shovels	3,055	2,595	1,491	1,184	1,466	1,263	1,211	1,293	1,843	2,012
Scythes and sickles	283	240	155	141	146	122	139	121	154	143
Mowers	1,434	1 990	1,303	598	606	511	842	557	635	1 050
Grain harvesters	1,187	2,342	672	640	835	783	1,547	680	1,101	1,063
Oil and wine presses	1,297	1,494	961	394	966	584	152	291	656	354
Other agricultural machinery	20,607	15,479	7,486	5,258	5,343	5,271	4,594	4,032	5,861	6,363
TOTAL	33,775	30,900	15,778	9,040	10,575	9,878	9 552	8,220	11,886	12,953
IMPORTS										
Tractors	4,019	5,342	6,335	4,396	3,333	2,334	1,637	3,126	4,918	4,686
Tilling and cultivating implements	1,580	1,202	1,241	430	281	194	61	162	486	312
Mowers	2,038	2,023	1,854	1,095	510	562	411	403	418	461
Grain harvesters	5,055	4,679	3,052	903	460	401	253	294	386	360
Cream separators and similar machines	735	777	696	397	574	367	343	308	479	315
Other agricultural machinery	6,204	6,670	5,668	3,464	3,155	2,564	929	1,108	1,539	1,401
TOTAL	19,631	20,693	18,846	10,685	8,313	6,422	3,634	5,401	8,226	7,535

TABLE XVII — *U S S R, imports and exports of agricultural machinery*

Description	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
	<i>Value in 1 000 gold rubles</i>					<i>1 000 paper rubles</i>				
IMPORTS										
Tractors	34 847	71 564	79 627	374	2 387	96	95	218	238	16
Tilling and cultivating implements	6 810	10 342	2 367	66	29	5	11	77	17	3
Fertiliser distributors seed drills and planters	3 054	3 158	1 621	18	3	3	1	6	1	10
Harvesting machinery	5 036	7 935	12 078	1	—	5	1	2	6	—
Threshing and similar machines	1 413	5 508	202	1	—	20	21	222	3	—
Dairy machinery	2 406	562	9	100	52	2	2	2	40	256
Other agricultural machinery	4 635	2 679	1 638	41	5	21	22	211	41	1
TOTAL	58 201	101 748	97 542	601	2 476	152	153	738	346	286
EXPORTS	599	969	2 074	1 909	767	587	627	3 667	5 212	4 944
	<i>Metric tons</i>									
IMPORTS										
Tractors	34 922	74 446	82 347	328	2 726	640	71	56	48	1
Tilling and cultivating implements	15 466	21 730	4 883	96	52	7	25	16	8	1
Fertiliser distributors seed drills and planters	6 192	6 045	3 000	27	8	7	3	2	0	9
Harvesting machinery	13 148	11 013	13 296	1	—	8	1	1	3	—
Threshing and similar machines	1 986	9 548	308	1	—	30	19	46	0	—
Dairy machinery	1 375	284	4	44	27	1	2	0	6	29
Other agricultural machinery	6 522	3 500	1 966	79	6	17	57	23	14	1
TOTAL	79 611	126 566	105 804	576	2 819	134	158	144	79	41
EXPORTS	1 274	2 030	5 470	3 640	1 682	2 660	4 229	5 447	7 619	7 562

TABLE XVIII — *Argentina imports and exports of agricultural machinery*

Description	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
	<i>1000 gold Pesos</i>					<i>Value in 1000 Pesos M N</i>				
IMPORTS										
Tractors	3 325	1 772	450	11	24	93	370	2 506	11 982	18 128
Ploughs	5 501	3 645	1 523	811	1 306	2 686	3 841	3 227	5 397	5 163
Other cultivating implements *	605	212	292	10	26	48	123	200	362	293
Seed drills	1 171	950	155	9	17	92	248	454	913	1 430
Grain harvesters	7 964	704	225	11	32	76	424	669	1 255	1 934
Harvester threshers	5 106	2 455	564	353	15	2 264	7 007	2 830	6 897	14 622
Threshing machines	504	132	11	4	5	3	13	85	289	577
Crushers grinders and similar machines *	314	139	188	89	97	47	115	119	259	133
Other agricultural machinery *	2 703	3 213	1 754	889	1 379	2 307	5 123	4 989	8 133	10 000
TOTAL *	27 193	13 222	5 162	2 187	2 901	7 616	17 264	15 079	35 487	52 270
EXPORTS AND RE-EXPORTS *	—	—	—	—	387	6 890	970	630	842	297
	<i>Number</i>									
IMPORTS										
Tractors	2 754	2 041	253	4	7	26	82	682	3 300	5 041
Ploughs	100 743	62 954	11 341	2 551	4 672	8 883	9 822	14 241	18 485	20 257
Seed drills	31 743	27 378	2 418	207	451	1 228	3 247	5 633	10 149	15 088
Grain harvesters	4 389	207	67	67	195	324	1 673	2 401	3 553	3 016
Harvester threshers	2 011	305	176	176	7	497	1 500	580	1 443	3 212
Threshing machines	110	3	2	2	2	2	4	21	72	138

Quantity not given

TABLE XIX — *Union of South Africa, imports and exports of agricultural machinery.*

Description	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
<i>Value in 1000 £</i>										
IMPORTS										
Tractors	532.7	162.5	55.2	32.2	45.9	173.5	205.1	219.7	248.2	396.0
Tilling and cultivating implements	568.5	278.9	165.3	143.0	180.2	328.7	384.6	445.7	568.1	488.9
Spades picks and hoes *	25.5	17.5	16.6	11.3	21.4	36.3	32.2	27.5	31.1	28.8
Spraying machines	20.4	11.9	10.5	5.8	7.9	29.6	21.2	15.1	17.0	18.1
Lawn mowers and garden rollers	16.5	15.4	13.0	11.5	13.2	25.9	22.2	21.3	32.0	37.3
Mowers and grain harvesters	83.5	58.3	46.7	51.9	60.0	122.5	142.5	119.4	113.2	72.3
Threshing machines	32.9	26.2	42.8	34.0	15.9	33.4	61.1	45.4	36.0	22.1
Cream separators	43.8	25.4	16.4	13.3	16.3	39.5	47.1	46.6	47.4	29.5
Other dairy machinery *	35.7	42.1	36.2	18.8	21.9	26.4	38.2	50.8	52.4	36.8
Other agricultural machinery *	446.4	280.8	125.4	85.8	89.4	226.1	254.4	230.8	344.2	265.3
TOTAL *	1 805.9	919.0	528.1	407.6	472.1	1 041.9	1 208.6	1 222.3	1 491.6	1 357.8
EXPORTS *	0.2	0.1	0.0	0.1	1.9	3.2	4.6	2.7	2.7	2.2
RE EXPORTS *	15.4	13.6	28.3	10.1	10.2	7.6	17.8	22.3	28.9	39.1
<i>Number</i>										
IMPORTS										
Tractors	2 696	626	114	71	74	621	708	922	1 108	1 803
Tilling and cultivating implements	77 107	46 465	27 174	20 592	23 285	54 058	67 756	76 523	100 811	78 345
Spraying machines	8 678	8 099	5 703	5 145	5 122	34 528	31 421	29 057	16 156	29 087
Lawn mowers and garden rollers	5 796	6 281	4 593	4 299	4 777	9 530	8 751	8 357	12 552	10 109
Mowers and grain harvesters	4 557	1 412	1 199	1 116	1 403	4 370	4 374	4 026	4 468	2 281
Threshing machines	140	119	154	119	41	105	204	163	117	67
Cream separators	10 843	6 181	3 918	3 200	3 364	9 552	12 252	11 475	11 137	7 097

* Quantity not given

TABLE XX — *Australia, imports and exports of agricultural machinery*

Description	1928/29	1929/30	1930/31	1931/32	1932/33	1933/34	1934/35	1935/36	1936/37	1937/38
<i>Value in 1000 £</i>										
IMPORTS										
Wheel tractors	836.0	712.3	271.1	18.2	41.3	95.1	224.2	703.1	977.3	1 406.1
Tracklaying tractors	331.5	330.5	39.0	6.4	18.5	60.1	160.1	269.2	499.5	843.8
Ploughs	78.6	67.0	31.5	8.8	5.0	8.6	12.9	8.4	18.2	17.5
Other cultivating implements *	77.8	49.4	4.8	1.3	0.9	2.3	4.8	5.6	9.6	18.8
Lawn mowers	98.6	96.8	19.4	5.6	11.1	13.4	27.8	28.4	21.9	19.5
Mowers	23.1	13.4	16.9	3.3	8.2	7.9	20.9	27.7	11.0	35.1
Grain harvesters and harvester threshers	114.8	58.6	39.2	—	1.4	8.0	0.8	15.0	13.6	36.9
Milking machines	3.0	9.3	5.6	3.1	2.1	2.8	5.9	11.0	15.1	32.8
Cream separators	151.3	146.6	150.3	142.8	186.2	99.6	112.1	124.4	144.1	120.5
Other dairy machinery *	19.6	55.6	6.5	5.6	8.6	12.2	24.3	15.9	25.7	38.0
Other agricultural machinery *	218.8	158.4	63.1	28.7	56.8	55.2	56.9	68.0	75.8	91.4
TOTAL *	1 953.1	1 697.9	647.4	223.8	340.1	365.2	650.7	1 276.7	1 811.8	2 660.4
EXPORTS *	39.4	87.8	65.8	24.7	29.2	33.4	57.6	75.9	108.1	105.3
RE EXPORTS *	9.2	9.6	5.8	2.0	3.7	6.9	3.7	8.5	5.3	3.9
<i>Number</i>										
IMPORTS										
Wheel tractors						407	1 157	3 937	5 886	8 525
Tracklaying tractors						167	473	944	1 558	2 501
Ploughs	6 241	6 350	2 793	904	391	1 485	7 219	887	1 940	1 785
Lawn mowers	51 822	54 708	8 568	1 553	1 802	5 233	11 274	14 725	8 339	4 712
Mowers	1 829	1 062	1 440	302	622	599	1 577	2 013	746	2 200
Grain harvesters and harvester threshers	2 374	1 172	1 107	—	24	250	29	468	379	798
Milking machines						99	163	651	707	1 187
Cream separators	17 098	15 172	14 042	15 739	21 536	12 524	11 980	13 764	15 133	13 755

* Quantity not given

TABLE XXI — *New Zealand, imports and exports of agricultural machinery*

Description	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
<i>Value in 1000 £</i>										
IMPORTS										
Tractors	237.3	153.5	29.0	14.0	20.5	95.9	194.3	386.9	734.3	806.4
Ploughs	8.9	9.3	9.5	8.6	8.1	12.2	20.4	25.7	29.0	35.9
Other cultivating implements *	28.0	16.2	4.4	4.9	7.1	15.2	26.0	31.2	47.2	44.2
Seed drills and fertiliser distributors	9.9	20.1	0.9	1.5	0.8	1.8	12.0	13.7	21.9	26.2
Mowers	47.9	51.6	6.1	16.6	22.9	31.8	41.9	69.6	73.7	66.6
Grain harvesters	18.7	15.7	5.5	9.3	31.6	10.2	19.8	32.7	30.8	18.8
Threshing machines *	1.5	1.9	2.8	4.3	5.7	15.1	10.7	22.4	19.7	14.5
Sheep shears *	32.4	25.1	5.8	10.8	13.3	24.4	22.7	35.9	39.8	41.9
Cream separators	62.6	95.9	56.0	142.6	95.5	97.4	85.2	104.6	70.9	45.5
Other dairy machinery *	75.5	95.2	39.8	36.3	37.1	52.2	48.6	58.6	58.5	68.7
Other agricultural machinery *	119.8	115.6	13.9	15.1	23.3	38.1	57.8	70.0	105.7	100.1
TOTAL *	642.5	600.1	173.7	264.0	265.9	394.3	539.4	851.3	1,231.5	1,268.8
EXPORTS *	17.9	12.4	9.6	8.8	6.1	12.4	13.9	22.7	28.3	36.7
RE-IMPORTS *	3.9	2.8	6.7	10.4	6.5	10.0	9.2	4.4	2.9	8.4

Number

IMPORTS										
Tractors	1,262	890	106	43	97	410	798	1,484	2,533	2,734
Ploughs	1,026	837	266	234	353	627	1,256	1,148	1,214	1,311
Seed drills and fertiliser distributors	956	1,668	30	88	2	112	536	732	1,066	1,310
Mowers	3,484	1,711	170	744	1,209	1,265	1,560	2,992	3,044	2,476
Grain harvesters	497	320	24	91	302	10	309	442	314	167
Cream separators	5,430	7,488	3,859	10,998	6,699	5,223	4,489	6,757	5,305	2,415

* Quantity not given

TABLE XXII — *Netherlands imports and exports of agricultural machinery*

Description	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
<i>Value in 1000 fl</i>										
IMPORTS										
Tractors		513	538	474	285	391	558	500	690	806
Tilling and cultivating implements	622	537	310	232	298	399	454	486	617	534
Seed drills	122	68	54	44	64	80	129	130	165	123
Mowers and grain harvesters	921	1,411	1,367	769	797	865	793	974	1,279	1,124
Threshing machines	473	547	436	300	515	533	584	422	384	232
Cream separators	259	193	140	141	154	114	127	155	214	243
Other dairy machinery	852	611	432	220	188	171	121	254	284	347
Other agricultural machinery	2,442	2,378	1,805	1,279	1,348	1,113	1,175	1,167	1,551	1,465
TOTAL	5,691	6,258	5,084	3,459	3,649	3,666	3,941	4,088	5,184	4,876
EXPORTS	420	473	435	331	312	307	251	253	458	371
<i>Metric tons</i>										
IMPORTS										
Tractors			203	209	174	292	426	362	456	453
Tilling and cultivating implements	1,348	1,048	630	601	1,025	1,296	1,614	1,789	1,882	1,514
Seed drills	219	140	110	96	151	224	387	414	459	333
Mowers and grain harvesters	1,843	2,859	2,846	1,578	1,839	2,623	2,197	3,057	3,349	2,665
Threshing machines	896	1,037	880	719	1,282	1,532	1,622	1,185	968	557
Cream separators	142	130	97	109	129	75	80	109	120	127
Other dairy machinery	467	367	282	180	236	230	150	276	272	275
Other agricultural machinery	4,492	4,456	3,390	2,565	3,062	2,772	3,333	3,366	3,746	3,262
TOTAL *	9,407	10,037	8,235	5,848	7,724	8,752	9,383	10,196	10,796	8,733
EXPORTS	588	695	565	448	492	530	459	464	599	589

* Tractors not included

TABLE XXIII. — *Italy, imports and exports of agricultural machinery.*

Description	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
<i>Value in 1000 lire</i>										
IMPORTS										
Tractors . . .	...	12,954	9 165	4,917	10,744	13,276	8,239	6,891	12,317	10,690
Tilling and cultivating implements	9,679	8,382	2,931	1,744	2,775	4,486	1,142	1,032	1,658	1,599
Scythes, sickles and similar tools	5,923	5,318	4,971	3,218	3,245	4,081	3,458	4,058	4,773	5,896
Mowers	12,177	17,820	8,228	5,838	5,154	6,503	4,428	3,895	5,877	5,496
Grain harvesters	7,269	4,308	3,004	1,125	2,063	1 337	1,705	2 307	4,165	2,704
Threshing machines	5,043	4,278	3,162	2,811	4,227	4,110	3,836	1,977	3,532	4,391
Cream separators	2,065	2,066	1,209	1,430	1,695	1,823	1,494	1,252	1,782	2,111
Other agricultural machinery	16,841	13,617	5,005	4,291	6 317	4,984	3,023	2,749	4,340	4,539
TOTAL	58,997	68,743	37,675	25,374	36 220	40,600	27,324	24,161	38 444	37,426
EXPORTS	6,403	13 679	6,266	3,614	5,402	5,985	4,765	5,698	16 448	19,496
<i>Metric tons</i>										
IMPORTS										
Tractors		1,643	1,071	552	1,622	2,357	1,594	1,170	1 588	1,122
Tilling and cultivating implements	2,545	2,150	805	602	974	1,614	405	398	483	389
Scythes, sickles and similar tools	444	404	405	311	350	462	429	400	408	399
Mowers	3,661	4,809	2,320	1,557	1 640	2,137	1,423	966	1,221	1 117
Grain harvesters	1,922	1,075	733	351	662	464	584	621	958	556
Threshing machines	829	713	495	548	1,007	1,081	1,176	550	752	827
Cream separators	153	165	97	146	155	183	132	86	110	93
Other agricultural machinery	4,066	3,534	1,204	1,218	2,085	1,719	1,058	966	1,189	1,027
TOTAL	13,620	14,493	7,130	5,285	8,495	10,017	6,801	5,157	6 709	5 535
EXPORTS	1,018	1,111	1 354	700	755	883	1,022	1,684	2,811	2,944

In spite of the recovery of the last few years, the international trade in agricultural machinery has not yet reached the high levels attained during the period 1927-30 whilst production, on the other hand, has in several countries surpassed the maximum previously recorded. In a number of countries efforts are being made to achieve self-sufficiency and this has led to a great increase in the home manufacture of agricultural machinery and an active internal trade with a corresponding reduction in foreign trade. In any case, there is an increasing demand for agricultural machinery in all the countries where conditions are suitable for its use.

Conclusion.

A general consideration of the situation shows that the production and trade in agricultural machinery is mainly concentrated in the temperate countries of the Northern and Southern Hemispheres.

The tropical zones in general have less need of agricultural machinery; not only because of the abundant supply of cheap manual labour but also because of the different conditions of tropical agriculture which calls for other

TABLE XXIV. — *United States, exports of agricultural machinery according to destination.*

Countries *	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
<i>Value in 1000 \$</i>										
<i>Europe</i>										
Germany	2,310	792	415	123	184	289	130	140	213	317
Austria	140	233	108	8	18	51	48	67	71	—
Belgium	514	395	126	124	48	79	101	109	212	209
Bulgaria	301	31	3	5	1	2	4	11	73	46
Denmark	525	579	173	27	14	46	49	59	17	35
Spain	744	447	216	89	169	260	327	101	3	13
Estonia	131	47	10	5	1	5	20	35	71	111
Finland	173	46	15	3	2	9	14	48	412	400
France	2,456	2,541	2,127	786	747	742	406	924	1,705	1,386
Greece	246	194	133	16	47	125	125	150	188	360
Hungary	598	239	31	7	1	1	0	9	0	16
Ireland	2,104	1,627	81	35	9	33	29	35	38	32
Italy	1,264	1,249	248	237	562	838	659	1,063	626	612
Latvia	24	51	30	3	6	21	10	45	72	30
Norway	67	78	70	15	7	30	32	89	174	350
Netherlands	210	203	165	106	95	209	306	261	345	436
Poland	300	52	16	4	2	10	14	18	38	32
Portugal	165	272	60	19	37	105	131	102	701	497
Romania	563	120	26	20	61	120	96	134	423	280
United Kingdom	1,844	2,016	1,415	687	1,008	1,592	2,578	2,974	4,575	3,496
Sweden	544	475	239	95	68	262	431	682	1,811	2,283
Switzerland	126	133	30	33	46	54	87	80	76	139
Czechoslovakia	239	118	93	38	7	9	49	59	94	110
U. S. S. R.	20,714	42,131	37,892	157	178	13	33	48	14	6
Yugoslavia	190	126	22	9	8	9	2	2	7	24
<i>America</i>										
Argentina	35,342	17,439	1,431	703	1,181	2,260	4,541	4,695	11,465	14,254
Brazil	1,329	643	85	69	204	420	580	840	1,453	1,532
Canada	37,714	24,485	4,882	2,357	2,393	4,278	7,339	11,247	18,667	20,665
Chile	866	619	99	5	11	29	108	211	661	632
Colombia	254	156	93	64	101	258	335	460	618	786
Cuba	1,161	561	242	52	86	181	169	322	381	315
Honduras	311	197	71	16	18	64	65	62	52	86
British Honduras	100	78	19	4	18	28	94	175	144	100
Jamaica	70	44	17	8	12	47	31	108	72	172
Mexico	2,148	2,503	1,420	282	509	1,282	1,917	2,228	3,263	1,450
Panama	108	108	83	64	45	33	75	53	57	34
Peru	389	211	72	50	111	279	409	483	674	707
Dominican Republic	99	75	36	24	78	43	52	66	95	102
Trinidad and Tobago	44	38	33	23	31	57	32	71	67	125
Uruguay	1,497	1,285	194	48	70	189	268	343	1,023	740
Venezuela	381	290	124	80	123	178	200	241	509	730
<i>Asia</i>										
China	186	89	46	14	21	39	45	82	78	83
India	433	312	138	72	159	182	175	269	316	313
Netherlands East Indies	213	116	30	19	19	153	59	79	201	324
Iraq	53	24	4	212	6	16	26	11	36	32
Iran	21	31	1	3	8	20	78	266	24	216
Japan	279	243	98	54	33	53	80	223	223	110
Palestine	77	67	47	197	267	214	297	130	240	159
Philippines	430	434	334	559	295	234	317	629	673	459
Siam	73	38	25	4	4	47	52	20	86	126
Turkey	357	128	31	8	20	18	57	104	320	104
<i>Africa</i>										
Italian Africa	4	7	18	45	70	79	529	43	58	229
British East Africa	681	302	30	14	16	27	64	153	271	417
Algeria and Tunisia	4,655	2,508	1,182	861	585	648	455	987	1,797	1,757
Egypt	562	238	86	34	66	168	241	298	398	364
Morocco	785	575	514	528	383	207	210	334	697	927
Mozambique	266	134	40	24	17	59	78	60	119	133
Union of South Africa	5,681	2,344	1,174	684	830	2,228	2,656	3,615	4,606	4,530
<i>Oceania</i>										
Australia	4,734	3,143	332	248	542	1,348	3,018	5,167	9,638	6,292
New Zealand	1,716	1,136	189	165	285	634	904	1,954	2,866	3,228
<i>Other countries</i>										
Other countries	1,290	1,013	439	303	272	629	823	711	1,524	1,539
TOTAL	140,801	115,809	57,403	10,548	12,215	21,543	32,040	43,985	75,331	75,442

* The countries are given in the French alphabetical order.

working methods, particularly as regards cultivation. Warm countries do not support, in the long run, over-intensive working, and continued cultivation without adequate manuring exhausts the soils more rapidly and irremediably than is the case in more temperate climates. A more exact study of the relationship between the intensity of cultivation, climate and the conservation of soil fertility would be a very profitable one and of great value to the development of agricultural machinery.

H. J. HOPFEN.

MISCELLANEOUS INFORMATION

An Organic Fertilizer Manufactured from Town Refuse.

An article on the disposal of town refuse was published in this Bulletin in January 1930 (p. 28) and the difficulties involved were clearly indicated. Proposals for the conversion of garbage into an organic manure have often been made but in few cases have the processes been thoroughly investigated from an economic and an agricultural point of view.

A notable exception is the new rubbish disposal plant at Wood Lane, London, W., which deals with the refuse of the Royal Borough of Kensington and whilst it is expensive in operation, the demand from the horticultural industry north of London for the manure "Hyganic" produced makes it economic.

Briefly the process is one of hand sorting on a conveyer belt, by which undesirable materials and those having other economic uses are removed, (Glass, paper, metal, rags, etc.) followed by crushing in cylindrical crushers, driven by electric power, and fermentation of the crushed material for 16 days in brick cells of 180 tons capacity. 250 tons of refuse are treated daily giving an output of 160 tons of manure, "Hyganic". To ensure satisfactory fermentation the crushed material is sprayed with a bacterial culture solution and the process is partly aerobic and partly anaerobic; during fermentation a temperature of 170°-175° F. is reached and there is a considerable evolution of gas; this being removed in flues, all objectionable smells are avoided.

The objections raised in the article quoted against the use of garbage as a fertiliser were the following, the dissemination of noxious weeds, insect larvae and fungus spores, and the low nitrogen content of the garbage which is further depleted by unsatisfactory fermentation, the difficulties encountered were the necessity of a preliminary sorting with its inherent danger to health and the small opportunities for mechanising the various processes.

All these difficulties have been overcome in the "Hyganic" process and handling costs are further reduced by using units of the disposal plant for the municipal garbage collection.

Fermentation processes are not new in this connection; in Italy in particular, where the cost of fuel for incineration is high, much attention has been paid to fermentation and chemical methods of rubbish disposal. However, the use of extra nutrients for the bacteria, a rationalised fermentation and finally the self sterilisation ensured by the high temperatures reached are new features in this process.

Analyses of the fermented product showed a dry matter content of 63.9-74.4 per cent. (average 70 per cent.) and the nitrogen content 0.97-1.42 per cent. (average 1.16 per cent.) on a dry matter basis; the material is sold ex-works at 9s.-6d. per ton.

The results of field experiments with the new manure are given in an article by Dr. Trip in "Chemistry and Industry", December 23, 1939 v. 58 p. 1102 and without

repeating them it will suffice to say that on an equal nitrogen basis Hyganic was not inferior to farmyard manure whereas on the basis of cost it was superior three times out of four. Rape dust was, in only one case, inferior to Hyganic on an equal nitrogen basis but the cost of the former has already lead to its almost complete disappearance from the fertiliser market. Experience has also shown that a large proportion of the nitrogen of Hyganic is readily available and, as the figures given cover only one year, residual effects are ignored; were these considered there is no doubt that the comparison with sulphate of ammonia would be greatly improved. It will be a matter of some interest to see a comparison with other manures carried out over a number of years for there are numerous other possibilities of beneficial or deleterious effects that may result from repeated applications of the new material that time alone can show. All that can be said at present is that the results obtained in the first year of experimentation are very promising indeed.

The experience already gained shows the process to be economically profitable.

A subsidy of 3s per ton of garbage paid to the manufacturer of the manure enables him to sell his product at the competitive price mentioned above whereas the usual cost of rubbish disposal in England is about 6 shillings per ton. £2,500,000 is spent in the United Kingdom annually for the destruction of refuse which has a potential value of £8,000,000 as manure. Hence, it is thought that this process is worthy of more general interest, especially as the lack of stable manure due to mechanisation of transport has already become a problem for the market gardeners in the neighbourhood of large towns.

J C H

The aims of plant breeding in German Agriculture.

The desire to ensure a domestic supply of food and raw materials has put a number of problems before the German plant breeder. The country can produce carbohydrates enough but there is a serious deficiency in oils and fats, proteins and textile fibres, merely increasing the area devoted to agriculture will thus not solve the problem. By putting a million hectares under forage crops rich in fats and protein it would be possible to cover the lack of oils and fats but this area could only be found at the expense of cereal and potato cultivation. Obviously, this is not a practicable solution except in so far as plant improvement and the regulation of harvests enable the necessary area for a given production to be reduced.

According to A. FISCHER, plant breeding should not only aim at increased yields but also at the improvement of quality and resistance to disease and insect attack. The regularity of the yield depends to a considerable extent on the latter and its importance may be gauged by the extent of such damage, which is estimated at 2,000,000 RM. annually.

CARBOHYDRATES

Rye.

The immediate aim of rye breeding is to obtain self-pollinating varieties in order to be able to proceed along the lines already followed with other cereals. Other points that have to be considered at the same time are resistance to cold weather, tillering, resistance to disease, the breeding of perennial varieties and finally the production of a grain rich in protein and suitable for bread making.

Wheat.

In the first place, the baking properties should be improved; even if the spring wheats may already be classed as A in this respect the winter wheats are still C. It is necessary to find varieties that can be put in class B. This quality must com-

bined with resistance to cold, a strong straw and high yields, together with resistance to rust, smut and other diseases. Yellow rust is the pest most to be feared in Germany. Certain wheats (Garnet, Panzer, certain local strains and the primitive and wild forms) are very resistant in this respect. The difficulty in crossing and breeding is that there are several biological races of yellow rust and their virulence to different wheats is not constant.

The limited area of good land available does not allow of a further extension of the area devoted to wheat. The less exacting varieties, from a soil point of view, might be cultivated in the lighter, sandy soils of the north and northeast. Crossings with local varieties have given encouraging results. On the other hand, wheat-rye crosses have enabled the simple requirements, the winter resistance and earliness of the latter to be combined with the good qualities of the former. Such crosses will soon be available commercially.

Barley

As a forage crop varieties are wanted that are resistant to lodging and drought and rich in protein. The selection of naked grain varieties with a high protein content is particularly important from this point of view. On the other hand, resistance to cold is still inadequate and none of the local or foreign varieties, not even those brought back by the Hindu Kush expedition, have enabled barley to be cultivated in the northeast without certain risks.

Spring barley is essentially a malting barley with two rows of grains, an average of 26,000,000 quintals are produced each year though only 9,000,000 to 10,000,000 quintals are absorbed by the brewing industry. Part of this production could therefore be replaced by the forage varieties with 4 rows of grains. The breeding of malting barley aims at the production of varieties that give a high proportion of soluble matter on malting and have suitably soluble proteins and at the same time a considerable resistance to disease—particularly to oidium and rusts.

Potatoes

Occupying 2,900,000 hectares, this crop takes second place after rye. Thanks to better cultivation, more attention to the soil and the use of manures and better varieties, this crop now gives yield exceeding by 105 per cent. those obtained between 1872 and 1882. The crops are greatly affected by the incidence of disease. Plant breeding has enabled varieties immune from wart disease to be produced but all are liable to attack by downy mildew (*Phytophthora infestans*) which causes damage to the extent of 100,000,000 RM annually and may even reach 500,000,000 RM in some years. Eight races of *Phytophthora* are at present known and amongst the wild solanaceous plants of Central and South America varieties have been found resistant to all 8 (*Solanum demissum* Tlaxpehnalcoense, *S. demissum* (El desierto) and *S. ajuscoense*), by crossing with these an attempt is being made to obtain immune varieties.

Degeneration reduces the annual crop by 4,000,000 to 5,000,000 metric tons; by crossing with wild varieties it is hoped to isolate strains resistant to virus diseases.

The Colorado beetle danger has doubled the amount of research aimed at producing varieties less subject to the depredations of this insect and here again wild varieties that do not suffer so badly are being used for crossing: *Solanum demissum*, *S. jamaense*, *S. commersonii* and *S. caldasii*.

In the same way, recourse is had to the primitive and wild forms for crosses that have tubers less subject to discoloring and varieties that do not suffer so badly from spring and autumnal frosts for, whilst the cultivated varieties sustain considerable damage at -1.8°C , *S. acaule* is resistant to -8°C and *S. demissum utile* to -3°C .

OILS AND FATS.

Present production covers 60 per cent. of the requirements. To improve the cultivation of oil bearing plants in Germany, it is necessary to select varieties with high yields and well adapted to the different types of soil and climate. At the present time the principal oil crops are the different varieties of rape and to a lesser extent poppy, mustard and false flax (*Camelina sativa*). However, the yield of oil from these crops is not entirely satisfactory and subject, particularly in the case of rape, to great variations as a result of parasites. On good soil and with suitable climatic conditions the following may be taken as the yield of oil per hectare colza oil (from winter rape) 670–1000 kg (from English rape) 620–930 kg; poppy oil 540–810 kg, mustard oil 300–340 kg, linseed oil (from false flax) 240 to 360 kg, but when conditions are less favourable or when there is considerable parasitism, these yields will be greatly reduced, and this is a grave hindrance to the development of the cultivation of these plants.

An attempt is now being made to introduce new oil-bearing plants and work is being carried out in particular with flax (linseed), hemp, tobacco, soya and lupin; the last two are of particular interest.

Flax is as important for the production of fibre as for the production of protein and oil. The varieties of flax, however, that are grown for fibre differ from those grown for oil by being taller and less branched than the latter. The "Forschungsinstitut für Bastfasern" at Sorrau (Niederlausitz) has raised the yield of flax to 16–20 quintals of linseed with an oil content of 40–44 per cent. per hectare. Flax grown for fibre gives yields of 7.8 quintals of linseed with an oil content of 32–36 per cent. per hectare; by crossing the latter with the former, the yield of linseed from flax for fibre has been raised to 12–16 quintals, with an oil content of 38–40 per cent. per hectare.

Tobacco.

The varieties of tobacco for cigarettes bred by the "Reichsinstitut für Tabakforschung" at Forchheim, near Karlsruhe, produce seeds that are rich in oil. This oil may be refined and used for alimentary purposes.

Lupinus

Lupinus albus and *L. mutabilis* are promising. It has been found possible to raise the oil content of *L. albus*, which is usually 8 per cent., to 15–16 per cent. *L. mutabilis* has even more valuable forms but they have been found more difficult to acclimatise. Plant breeding should however make it possible to obtain varieties of these two lupins that are adapted to the German soil and climate and at the same time retain their value as oil-producing plants.

Soya.

For a long while there have been attempts to introduce this plant but they have all gone amiss for the soya does not ripen. Plant breeding should be able to produce varieties that ripen in Germany whilst retaining their character as oil and protein producing plants. It has already been possible to isolate one that always ripens in Germany.

PROTEIN.

The solution of the protein problem is bound up with the question of oil production. Inasmuch as an extension of the area under oil seeds would not be able to cover all requirements of oil and fats it is necessary to have recourse to animal fats.

An increase of animal products is dependent on an increase of fodder production and particularly on a supply of fodder rich in protein which alone can improve the output of milk and lard. The protein question is therefore above all a question of fodder production and plant breeding work has followed on these lines during the last few years.

The annual production of protein for cattle feeding varies between 3,800,000 and 4,200,000 metric tons whilst the annual requirements are from 4,500,000 to 5,000,000 metric tons; the difference, about 800,000 metric tons, was formerly imported. To cover it now, the production of plants rich in protein, and particularly leguminous crops, are being increased, both as field crops and as catch crops.

The part played by plant breeding is considerable, possibilities for production exist in the east but there are obstacles to cultivation there, arising from the small rainfall, the danger of night frosts and the shortness of the growing season; further, the majority of the soils are light and sandy so that plant breeding will have to satisfy very exact requirements.

Lupin

The sweet lupin, which is free from alkaloids, was first produced by the "Kaiser Wilhelm Institut für Züchtungsforschung" at Munchberg (Mark) and represents an important advance. There have been sweet lupins with yellow and with blue flowers on the market since 1934. In 1938, 78,450 hectares were under this crop for fodder and seed production. These lupins are suitable for growth on light soils as well as on medium soils where clovers do not thrive and they may be used as green feed when cut or they may be ensilaged. The protein content of the lupin is 44–48 per cent., that of the blue lupin 31–36 per cent. Other researches have led to the isolation of a yellow lupin the pods of which remain closed in dry weather when mature and further it has been possible to combine the factor for sweetness with that for the non-opening of the pods. The work is being continued with a view to increasing the yield, earliness, etc.

Red Clover.

The aim of plant breeding with this plant is the creation of varieties that are resistant to cold and drought, not exacting in soil requirements, immune from disease, (*Sclerotinia trifoliorum*), and yielding sufficient seed under the climatic and soil conditions of the country to increase the production of indigenous seed.

Lucerne.

Selection work on this plant has the following objectives: drought resistance, regularity of yields, disease resistance, (especially against Mildew and *Sclerotinia trifoliorum*), and protein content. For the north and east of the country it is necessary to obtain a variety that grows in light and sandy soils (sand lucernes). 75–80 per cent of the necessary lucerne seed is now imported; the home production of seed is essential and must be increased as the crop expands.

TEXTILE FIBRES.

Flax

Germany requires 65,000 metric tons of lin fibre annually; this represents the production from 80,000 hectares with an average yield of 32.59 quintals of flax straw per hectare. In 1938 the old Reich had 44,872 hectares under this crop and to this must be added 2400 hectares in the Ostmark.

The ordinary varieties of flax contain 15–18 per cent. of fibre. By selection, varieties have been produced that contain 21–24 per cent. Under favourable condi-

tion these varieties can produce 900—1200 kg of fibre per hectare. Present efforts are directed to the production of varieties that combine high yields of fibre with high yields of seed.

Hemp.

In 1938, the area under hemp in the old Reich was 12,609 hectares and the production was 60,000 metric tons. Breeding of new varieties is especially due to private initiative and more particularly to the work of SCHURIG at Marke (Havelland). The tendency now is to produce varieties giving an increased gross yield per hectare and at the same time rich in fibres and bearing ripe seed. An attempt is also being made to grow hermaphrodite varieties in order to avoid the difference in the crossing between the male and female plants.

Nettle.

Amongst the substitutes that have been tried, only the common nettle has been found satisfactory. By breeding it has been possible to produce a fibre nettle which grows from 2 to 3 m. high and yields 6,000—8,000 kgs of stalks per hectare. These stalks have a fibre content of about 13 per cent. (i.e. 750—1000 kg per hectare). This nettle multiplies vegetatively and can be cultivated on light mineral soils with much organic matter or even on fen soils that are free of weeds.

A. H.

An interesting leguminous fodder plant in the Misiones Region (Argentina).

Among the indigenous leguminous plants which have been methodically studied at the Agricultural Experiment Station, Loreto (Misiones) there is, according to a booklet by M. MATINELLI, the director of the station (Buenos Aires, 1939, 16 pp. figs. tables), a number of species, of *Desmodium* that are suitable for fodder. In particular *D. cuneatum* Hook and Arnett is important, for animals relish this plant and it has a high nutritive value. The conditions obtaining at Misiones are particularly favourable for its growth.

The search for new fodder plants is especially important for the development of cattle breeding in Misiones on account of the lack of suitable feeding stuffs. A large part of the higher land in this region is stony or has such a poor vegetable cover that it is easily washed away by the rains. The conditions are thus very unfavourable for the growth of tender forage and the rigorous climate accentuates this difficulty. The two critical seasons of the year in the production of fodder crops are the winter, with temperatures of 9° C 20 cms below the surface (such as was actually recorded in 1933) and the summer with its brilliant sunshine, a period of dryness, which though short as a rule may in some years, as in 1935-36, extend over 80 days.

These two unfavourable factors give rise to difficulties in acclimatising both tropical and temperate forage crops. The author gives much information on *D. cuneatum* and on the results obtained with it during four years of experimental work. The data obtained by chemical analysis and the observations on the cultivation may be summarised as follows:

(1) It is a sort of woody perennial which grows from 1.5 metres to 3 metres high and it occurs native in several South and Central American countries.

(2) Vegetative growth ceases during the coldest months and the aerial part dies back to within 20 to 30 cms from the ground. The plant remains alive at a temperature of —9° C.

(3) Its hardiness makes it possible to cultivate it on stony soil, on steep slopes and in very shallow soil where most cultivated plants would fail to grow.

(4) It is sown at the beginning of September in rows 15 cms apart at a depth of 4 cms; 80 kgs of undressed seed per hectare are used, this corresponds to 40 kg, approximately, of dressed seed.

(5) It is particularly suitable for laying down hay meadows and may also be used in association with grasses to improve pasture land.

(6) Two or three cuts per year are possible at the time of blooming, each cut gives 5000-6000 kgs of fodder per hectare and the mean production is 16 metric tons of green fodder per hectare, the yield of seeds is 400 kgs per hectare.

(7) The chemical composition is satisfactory; it is possible to improve the nutritive value by cutting before the stems are completely lignified, on the other hand the value of the leaves, as regards the digestible protein content, is very nearly as high as the majority of the lucern varieties grown in Argentina. It will be necessary to make further analyses before, during and after bloomings to determine the best time for cutting.

(8) Hay prepared from this crop is excellent and represents 36 per cent of the weight of the green fodder. The preservation of the leaves after the haymaking season is better than is the case with other leguminous plants such as lucern.

In the green state or in the form of hay it is a forage that is greatly relished by animals especially by horses and mules.

A P

The Cultivation of Henna.

A complete survey of the cultivation of henna in the Moslem world has recently been given by Francis SCARONE in *Agronomie Coloniale*, Nos. 256 and 257, pp 97-107, 129-140. It seems worth while to repeat here the outstanding characters of this crop.

Henna (*Lawsonia inermis* L.) belongs to the order Lythraceae, it is a woody perennial but is cultivated almost as if it were an herbaceous plant. The crop is in the ground for four years and it is never included in a rotation; however the plant may often be left in the ground for twelve years and even twentyfive years is not unknown.

The principal henna growing countries are India, Egypt, Iran and Tripolitania; of secondary importance are Hedjaz, Yemen and Somaliland, and a little is cultivated in French North Africa.

INDIA.

The principal Henna growing region in India is in Sind; some henna is also grown in Bengal and the North West Frontier Province for local use. In the provinces Bombay and Madras Henna is grown as a hedge or as an ornamental shrub. The export trade passes for the most part through Karachi. In India it is only cultivated after repeated working of the soil and liberal manuring. The seed is sown from March to May according to the district. To assist germination the seeds are given a preliminary soaking; 500 kgs of seed per hectare are sown and as soon as the land is sown it is inundated and later, irrigation takes place only once per day when the young plants appear. In July or August the plants are planted out 30 cms in each direction and in the first year no harvest is taken. About 20 cms of the main shoot is cut off at each harvest and it is estimated that the two harvests together (April-May and October-November) yield 1500 kg of dried leaves per hectare.

EGYPT.

Henna is cultivated in Lower Egypt and to a small extent in Upper Egypt near Assuan. Very large shipments are despatched from Alexandria. Henna is cultivated in rotation with beans and barley, it is propagated by cuttings which are planted in

April. The slips have 8 to 10 buds and they are planted 10—15 cm apart on inundated soil. For 15 days after planting the crop is watered continuously but when the leaves have started to grow it is only watered once in 4 or 5 days. The leaves are harvested in September or November and a month sooner in Upper Egypt. The yield is 1 cubic metre of powder per hectare.

IRAN.

Henna is cultivated in the province Kerman and at Bender Abbas is the south west of the country. The output is 1200 quintals. The crop is grown very carefully, seedlings are planted in well worked and manured soil at about 3000 to 4000 plants per hectare; the plants are allowed to grow as a rule for about 10 years. Irrigation takes place every fifteenth day. The leaves are first collected when the bushes are 60 cm high and afterwards three or four times a year, at the end of the season the flowers are also collected, and these yield the henna which is most sought after.

LIBYA.

Henna is cultivated in the neighbourhood of Tripoli, in the Tadiura and Suk el Diuna regions, and to a small extent in the oasis of Fezzan. For several years now, in the regions that have been colonised, the Italians have adopted henna culture and are obtaining excellent results.

The area cultivated is of the order of 400 hectares and production amounts to 5,000 quintals. The crop has been improved by applying the results of experimental work at the Agricultural Institute of Sidi Mesir.

YEMEN AND HEDJAZ.

In the Yemen henna is cultivated in certain mountainous districts that are famed for the high quality of the product. Maowyah and Sherman near Taken are two such regions. Henna is also grown in Yanbo and Wady Fatima in Hedjaz.

NORTH AFRICA.

The cultivation of henna in Algeria is limited to the Saharan oasis Touat and Goura. In Tunisia it is cultivated in the Gabes region, the Isle of Djerba and the oases of S. Tunisia. In Morocco henna is cultivated at Sidi Ali Azenmour. Several years ago trials were made around Marrakech but they have been abandoned; there is also a sporadic cultivation of henna in the Tafilalet and finally there are some new trials being carried out in the neighbourhood of Fez. In Southern Morocco henna is cultivated on deep rich soils that are permeable and contain much humus, transplanting of seedlings is preferred to propagation by cuttings. Sowing takes place at the end of April in a well worked soil, the humidity is maintained by successive waterings and planting out takes place in May of the following year. The crop is harvested with a sickle when the bushes are 50 cm high and three cuts are made each year. In North Africa, and in particular in Morocco, the yields are poor being 200-225 kg. the first year and increasing regularly till the fifth year and after this it varies from 600-1000 kg per hectare.

The uses of henna. — Henna, which is almost exclusively used as a hair dye in Europe and America on account of its absolute harmlessness with respect to the hair and its tonic action on the scalp, is worthy of wider interest in the dyeing industry. The chief colouring matter is easily extracted and can produce beautiful tints and their fastness makes them particularly useful. Amongst the present industrial uses of henna only the dyeing of wool and light leather to a beautiful orange colour are of importance. Tunisian cabinet-makers use a henna infusion to give a colour to furniture made from light coloured wood.

In Europe the leaves are treated with alum and iron sulphate to manufacture a black dye that is called "noir d'Afrique" and which is employed in silk dyeing to give a brilliant black colour with a beautiful blue lustre. Finally innumerable therapeutic uses of this plant in its country of origin must be mentioned. The European pharmacopoeia have dropped this plant but in Morocco and in many other countries henna is still used as a topic dressing for inflammations and wounds. In India even more uses are found, thus the leaves are prescribed for migrain and the bark for jaundice, hypertrophy of the spleen and stone etc.

Amongst the natives henna is used for ritual and has a symbolic meaning. Among the Moslems the henna flower is the symbol of nobility and the use of henna a sign of joy and happiness.

The chemistry of henna was first studied by BERTHELOT. His work and that of his successors led to the extraction of a colouring material that has been identified as hennatannic acid. More recent research has shown the presence of other substances in the warm aqueous extract including tannates of a glucosidic character and an orange dye called lawsone (oxy-naphthoquinone, $C_6H_{10}O_4$). Henna seeds contain a greenish coloured oil that resembles poppy oil.

J. L.

The Institute for the Examination and Control of Agricultural Implements and Machinery at Belgrade, Yugoslavia.

This is a state institution set up by Ordinance No 70-XIX and forms part of the Ministry of Agriculture at Belgrade.

The Institute will undertake the examination and control of agricultural machines implements and tools in accordance with the provisions of the ordinance. It will also undertake scientific research work and the investigation of agricultural engineering problems.

The examination of some machines implements and tools is compulsory, the Ministry of Agriculture acting on the advice of an advisory committee of the Institute will specify by decree which machines must be so examined, in the case of other implements tools and machines which are not subject to a compulsory examination these will only be tested at the request of the manufacturers, traders, agricultural institutions or private people.

Machines subject to compulsory examination must be declared at the Institute for examination before they may be put in circulation.

All firms manufacturing agricultural machinery implements or tools or who sell the same as the representatives of foreign manufacturers are bound to place at the disposal of the Institute one or more examples of each kind or type of machine as may be required for the compulsory examination. After examination the Institute must return the machines or tools to the owner.

When the machine is approved and advice on it can be given, an account will be published by the Institute in the daily newspapers and the technical reviews. If an unfavourable report is given about an instrument of foreign manufacture, the Ministry of Agriculture will prohibit its importation.

A permanent exhibition of agricultural machinery and implements will be set up at the Institute and it will be possible to exhibit machinery and implements that have had a favourable report.

Help will be given in the purchase of nationally manufactured implements and tools that have been found by the Institute to be perfectly suited to requirements,

H. J. H.

Sixth International Congress for Agricultural Industries.

The following is the text of the resolutions adopted by the General Assembly.

The Sixth International Technical and Chemical Congress of Agricultural Industries adopt the following resolution that

SECTION I. — *Biology.*

Recognising the growing importance of the action of vitamins in living phenomena, the attention of the Governments is drawn to the necessity of —

(a) Making a systematic study of the factors that determine the vitamin content of plant and animal products.

(b) Carrying out research on the methods of increasing and stabilising the varieties that have the highest contents of each vitamine particularly, by breeding methods.

(c) Deciding on certain methods to ensure the conservation of the vitamins during the treatment of agricultural products, either industrially or in the kitchen.

(d) Developing and co ordinating research work on different lines on a national and international basis in the interests of science and the agricultural industries

SECTION II *Methods of Analysis, Instruments and Laboratory Apparatus.*

(1) In order to arrive at a simplification of the methods of analysis the Sub-committee set up within the International Commission for Agricultural Industries should, as soon as possible, get in touch with the different national organisations so that they can communicate, by reports to congresses for agricultural industries, the result of their work and experience on this subject especially since the previous congress.

(2) Proposals for the standardisation of the methods of analysis for wheat and flour should be drawn up by a mixed committee made up of the Delegates of the International Commission for Agricultural Industries and the Delegates of the International Institute of Agriculture

SECTION X. *Wine, Cider, Must and Grape Juice.*

(1) Recognising the excellent results of the measures taken by the different Governments of the wine producing countries in execution of the recommendations formulated by International Congress in Paris and the Conference in London, particularly with regard to the equilibrium between production and normal consumption, by the limitation of the area of vineyards and the protection of quality wines, all wine producing countries should be advised to withdraw the excess and arrange for its disposal by a system of regulations that will allow vine growers to sell their crops at a remunerative price

(2) The use of oenological products in wine making should be limited and the amounts tolerated should be reduced.

(3) Methods of preventing diseases or accidents should be investigated in order to avoid the hazards of curative treatment.

(4) The study of the role of metals accidentally introduced into wine should be given priority on the agenda of the next Congress.

SECTION XI. — *Malting and Brewing.*

The following terms should be adopted in describing the properties of malt.

(1) For the final condition: Auflösungsgrad, Degré de transformation.

(2) For the two principal properties:

(a) Friability, Mürbikheit, Friabilité.

(b) Enzymic activity, Enzymkraft, Activité diastatique.

SECTION XIV. — *Dairying, Buttermaking and Cheesemaking.*

(1) The following questions should be given priority in the agenda of the following congress.

(a) Study and standardisation of the different chemical and physical methods of determining the acidity of milk

(b) Study of the purification of effluent water from dairy factories

(2) The attention of the different Governments represented at the congress should be drawn to the importance of raising the standard of training of the technical staff employed in dairies, either by the organisation of special Dairy Institutes or by the founding of chairs in dairy science at the Universities and Colleges

SECTION XX — *Production, Distribution and Consumption.*

Priority should be given on the agenda of the next Congress to the study of methods of preservation of products from the time of production till they are consumed with special reference to the retention of,

(a) their outward appearance

(b) their content of nutritious substances

(c) the presence of accessory nutritive matter

SECTION XXI — *Legislation and International Agreements*

The attention of the Governments should be drawn to the necessity of setting up legal protection for agricultural industries particularly with regard to the use of trade marks and names of origin

The International Commission for Agricultural Industries should make the measures already adopted in this connection known to the different countries concerned

The same protection should be assured in the International field by suitable agreements

The attention of the different Governments should be drawn to the necessity of protecting the agricultural worker, as far as possible by similar legislation to that applied in industry for the protection of industrial workers, certain modifications would be indispensable and such legislation should cover even those who were only temporarily employed in agriculture.

G. R.

BOOK NOTICES *

BAUWENS Léon *Code de l'enseignement technique et de l'enseignement agricole.* Bruxelles 1939 L'Édition Universelle S. A., XIV, 337 pp., price 40 belgas

As the title shows, this book is a collection of the legislation dealing with technical and agricultural education in Belgium

In an introduction the author first defines what is understood in Belgium by "enseignement technique" Theoretically such training should include all branches of study that lead up to the various trades and professions in industry, commerce, transport, agriculture, applied art, administration and even domestic economy, however, the administration makes a very exact differentiation between technical education in the strictest sense and agricultural education and for this reason the author treats them separately

The book is divided in four parts The first, dealing with general legislation, contains all the Royal Decrees that refer at the same time to agricultural and techni-

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* Reviews of books presented to the library appear under this heading.

cal education. The second part dealing with technical education is concerned with the laws relating to technical education in the narrowest sense, whilst the third deals with agricultural education. In the fourth part the salaries of officials and the subsidies granted by the State are given, still keeping a clear division between technical and agricultural education.

This small collection will be a valuable help to anyone requiring exact information on the legislation and administrative organisation of technical education in Belgium.

S. G.

ALFANI A. *La difesa del suolo negli Stati Uniti, di America*. Foreword by His Excellency Arrigo SERPIERI, Firenze, Biblioteca Coloniale, Regio Istituto agronomico per l'Africa italiana, 1939, 344 pp., 162 figs.

This book is the result of a journey that the author made through the United States to study the measures taken for soil conservation there. The journey was undertaken with a view to finding whether the same measures might be of interest to Italy or to Italian East Africa. It would have been better if the author had given in detail the work already accomplished in Italy and that in progress in the United States but he limits himself, in the former respect, to the reproduction of several very instructive photographs of the erosion phenomena observed in the "agro romano" at the beginning of the book and he does not return to the Italian aspect of the problem until the end, where he expresses the opinion that the erosion problem takes a different form in Italy from that in the United States but that there is much in the latter country that is analogous to the problem in Italian East Africa. The author is aware that erosion control did not begin yesterday in Italy, and in recent years it has been undertaken even more thoroughly since the initiation of the "bonifica integrale" program. (See for example ALBERT OLIVA *Le sistemazioni idraulico-agrarie dei terreni asciutti di pianura, collina e montagna*). A comparison of Italian methods with those practised in the United States would have been certainly of great interest but it would seem that such a comparison does not enter within the scope of this work.

However, the book does contain a remarkable documentation on the grave problems of soil defense and we do not know another, published in Europe, that treats the recent progress made in the United States so thoroughly. As a source of information this book will be of great service to those who have not the opportunity of examining all the extensive American literature on the subject.

The origins of the Soil Conservation Service and its close collaboration with the C. C. C. Camps (Civilian Conservation Corps) are clearly explained to European readers who have often difficulty in obtaining documentation on the legislative measures of the United States. The demonstration areas and the working of the propaganda service is described. The second part of the volume is the most interesting: the author there describes all the measures taken for the conservation of the soil, (rotation, strip cropping, cover crops, contouring, etc.) and he bases his statements on observations made on the spot. The study of the topography of land for improvement, the first step in the improvement itself, is described in detail and so are all types of machinery specially adapted for soil conservation practices which are hardly known in other countries, such as those for terracing contour ploughing and other purposes. Finally, there is a chapter that gives a resumé of the methods used for measuring soil erosion in a given region.

W. B.

MÉNAGER H., *Rapport de la Commission des Oliviers sur l'Olivier au Maroc*. Service de l'Agriculture et de la Colonisation. Rabat, 1938, 31 pp., fig. and tables.

The Director of Economic Affairs set up the "Comité d'Études Pomologique" (Fruit cultivation study committee) in 1936 to study the possibilities of development and improvement of the fruit production of Morocco and its possible effect on the economy of the country.

The study committee then set up several sub-committees to study each of the principal branches of fruit production in great detail and the present report, edited by M. MÉNAGER, secretary of the Olive Subcommittee, is a complete documentation of the science and practice of olive growing and oil production in Morocco.

The book is divided in two parts; in the first part, M. MÉNAGER gives a list of the varieties of olive, studies the varieties imported and comments on their production, comparing the different varieties, their yield and the quality of their oil. In the

second part he discusses the possibilities for olive culture in Morocco, sketches a program of planting to be undertaken, mentions the precautions to be taken to ensure success and estimates the economic and social results that can be expected.

The chapter on the varieties growing in Morocco in 1938, the majority of which were investigated at the official laboratory, is very interesting. Their classification by origin reveals that there are six French, nine Moroccan, three Algerian, three Tunisian, eleven Spanish and twentytwo Italian varieties and a further two of unknown origin, making fifty-six varieties in all. They are then classified according to the use made of the olives (oil making, preserving, extra fine, whether for table or oil extraction). The best varieties are indicated from the growth and fruit-yielding point of view.

Another well documented chapter on a number of trials and analyses gives information of great value on the weather and soil requirements of the olive and the best methods of propagation and treatment.

The second part of the report shows the importance of the cultivation of the olive in Morocco and the possibilities for further development. In 1938 it was estimated that there were 7,656,526 olive trees and that 100,000 hectare were devoted to this crop; of the trees, 6,957,609 were owned by natives and 698,827 by European planters. Since 1922 the number of olive trees has been trebled and the average annual oil production is now 100,000 quintals per year, a fairly low figure for the area of the olive gardens and for the number of trees. This production is more than enough for internal consumption and in 1937 and 1938 there were actually exports of 880,000 quintals, the prices on the world markets being nearly three times as high as in 1936. Olive oil is being replaced by seed oils in the internal market as these are less expensive. Nevertheless, the consumption of oil in Morocco is very small (2 kgs per person per year) when compared with other oil-producing countries (5—12 kgs per person per year).

The proposed planting program will increase the number of trees to 25,000,000, and the area to 300,000—400,000 hectares. This increase is to be made by grafting on wild olive trees already growing and by laying out new plantations, for Morocco still has land that is well suited to this crop. At the present time the two principal centres are in the regions of Fez and Marrakech (71.5 per cent. of the total plantations).

The report of M. MÈNAGER is based on his own personal investigation and observations, and on information gleaned from the technical services. It is a very important contribution to the knowledge of the questions that arise in Moroccan olive cultivation. Though only a small book, it covers a great number of problems of the greatest interest and the work is well executed, clear, exact and methodical.

A. P.

VAYSSIÈRE Paul, *Principes de Zoologie agricole*. Paris, Armand Colin, 1930, 222 pp., 24 figs., price 15 francs.

This is only a small book but it is one that contains much information and serves an obvious purpose.

Every year parasites levy a heavy toll on cultivated plants throughout the world; in fact as Eugène ROUX said, we only harvest what the pests leave for us. For this reason it is necessary to encourage the study of applied zoology and to inculcate in young zoologists and agronomists a keenness for the study of animals on a practical and economic basis. Research in applied zoology is difficult and demands a specialisation which can hardly be acquired in many countries because there is no public instruction given on this subject.

The author has demonstrated the importance of the study of animals, both useful and harmful, and how, when one endeavours to go into the part played by them, and to suppress one and encourage another, an enormous number of problems arise which are difficult of solution.

From the opening chapters, which deal with the fundamentals of agricultural zoology, the theme passes logically to plant resistance and to cultural methods. Particular attention is given to physical factors that may influence the development and evolution of plant-eating animals; then comes a study of the biological factors in plant protection and a summary of the animal pests associated with different crops. After devoting a chapter to nematode parasites of plants and another to locusts, the author shows how physical agents and chemical products may take a part in the control of plant pests.

The book concludes with a bibliography of the most useful books and references.

G. R.

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(*) *List of abbreviations*: bihebd. (biweekly); bimens. (twice monthly); bimestr. (every two months); déc. (every ten days); étr. (foreign price); fasc. (copy); hebdl. (weekly); int. (home price); irr. (irregular); mens. (monthly); n° (number); N. S. (new series); p. a. (per annum); q. (daily); sem. (half yearly); s. (series); trihebd. (every three weeks); v. (volume); trim. (quarterly).

N. B. — Between brackets [/] are given translations and explanatory notes not appearing in the title of the review.

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Prof. UGO PAPI, *Segretario generale dell'Istituto, Direttore responsabile.*

MONTHLY BULLETIN

OF

AGRICULTURAL SCIENCE AND PRACTICE

ALMOND GROWING THROUGHOUT THE WORLD

In this series of articles the following countries will be dealt with Spain, Italy, the United States, French Morocco, Portugal, Turkey, France, Algeria, Greece, Tunisia. An attempt will be made to give a general view of the present position with regard to almond cultivation at the present day and the methods of working that are in use.

INTRODUCTION.

Numerous requests for information on almond growing and the trade in almonds in different countries have been sent to the Institute. This question seems to have roused considerable interest in many international circles and in order to meet, as fully as possible, this demand for information we propose to publish a series of articles on the principal almond-producing countries. In particular, in order to bring up to date and to supplement the information already at its disposal, the Institute sent a questionnaire to the different almond-growing countries in May 1939 but the data that we have received are still very incomplete and fragmentary owing to the way in which this crop is grown. Although the regular plantations have considerable importance, particularly in the three chief almond-producing countries, Spain, Italy and the United States of America, in other countries and even to some extent in the three countries mentioned, many almond trees grow in irregular plantations, in mixed orchards, sometimes in association with arable crops or other trees or on the sides of hills and along the edges of fields and roads. This distribution makes it very difficult to compute exactly the area devoted to this crop or even the total number of trees and their production.

These difficulties can, however, to a large extent be overcome and it appears possible to make a tolerably complete survey of the cultivation of this important tree. It allows, in fact, a profitable crop to be cultivated in many dry regions that are not, suitable for other uses. The following are the principal almond-producing countries in the order of their importance: Spain, Italy, the United States of America, French Morocco, Portugal, Turkey, France, Algeria, Greece and Tunisia.

ORIGIN AND BOTANY OF THE ALMOND TREE.

Although this tree has been known since very remote times there is no agreement as to its origin. Some writers suggest the Caucasus and temperate regions in Western Asia, others North Africa where it is still found wild. It

must be regarded as a tree of the Mediterranean region where it has been cultivated since prehistoric times for in Greece, where it is also found wild, it was cultivated 3,000 to 4,000 years before Christ. From Greece it was taken to Italy and Spain and its existence in France is mentioned in the eighth century. Finally, about the middle of the nineteenth century, it was introduced to the United States and was cultivated particularly in California.

The almond tree (*Amygdalus communis*), is a plant of the family *Amygdalaceae*. It grows to a height of 4-7 metres and has a twisted trunk and lanceolate, finely indented leaves arranged alternately. The flowers are white or pink and appear in pairs or singly from January to March before the leaves. They arise from special fruit buds and the corolla is made up of five petals and, in several varieties, six. The fruit is a long drupe, more or less flattened, it is built up of three parts (1) the pericarp which is fleshy and of a greenish grey colour, this becomes tough and leathery when the fruit dries; (2) the endocarp or shell, which is woody, of a bright brown colour, about 3 cms long and of an oval or elongated shape, in some cases the outer part is porous and friable and the deeper tissue is a firm, fine textured parenchyma; inside the shell is (3) the kernel which is the almond itself, it weighs between 2 and 6 g. Very occasionally two kernels are found in one shell, in such a case they are flattened on one side and round on the other or and their size is variable. The fruit buds are always to be found on two year wood.

GEOGRAPHICAL DISTRIBUTION.

The almond grows between lat 30° and 40° N. it is however to be found in England and on the Norwegian coast as far north as the 60th parallel but it seldom bears fruit in these conditions. The tree is able to survive extreme cold and drought but above the 44th parallel it has to be well protected on account of the sensitiveness of the flowers, which, as was remarked above, appear before the leaves.

Altitude exerts a marked effect on the development of the tree in general and above 700 metres it will not grow. At this altitude it is very stunted and the harvest becomes problematical. The hard shelled varieties are the more resistant to high altitudes. Cultivation is however carried on up to 800-900 m and, as an exception, trees may be found as high as 12,000 m, for example in the Caucasus.

When the altitude is not excessive, the position need cause little concern. When they face north, the almond trees bloom rather later and so are in less danger from white frost.

Climate plays an important part in the cultivation of the almond. Its early flowering (it is the first of all fruit trees to bloom) is in itself a danger, for the tender flowers unprotected by foliage fade and fall with the least frost before they have set. The tree blossoms in January to March as a rule in Mediterranean countries and only in Germany and Norway is it as late as April.

The effects of frost vary with the humidity of the flowers, if they are dry they are more resistant but if moist they are sensitive in the extreme; the fruit on the other hand, stands the frost very well if it is not damp.

I. — SPAIN

Development of Almond Cultivation.

It is thought that the almond was introduced to Spain by the Romans one century before the Christian Era. It seems that they planted the almond at several points in the east but it is only since the beginning of the present century that almond growing has been taken up on a large scale. Cultivation has moreover almost doubled in extent, production having been started, during the last 15 years, on the sites of the vineyards destroyed by the phylloxera. At the present time, this tree is of great importance in Spain and in some regions, such as the Balearic Islands, it may even represent the chief source of revenue whilst in others it is an important source of wealth and the subject of a considerable export trade.

TABLE I. — *Area and production of almonds during the last thirteen years.*

Year	Area of regular plantations (ha)	Total number of almond trees	Total production of almonds (in quintals)	Value (pesetas)
1922	72,527	15,871,598	728,318	—
1928	111,061	24,866,765	1,104,236	—
1929	116,514	26,634,359	1,122,710	108,147,403
1930	140,937	29,354,573	999,771	97,520,068
1931	140,998	29,584,247	1,023,393	100,852,572
1932	141,620	29,297,130	999,447	97,946,914
1933	149,676	31,027,463	1,598,660	137,780,175
1935	154,800	31,826,685	1,480,800	—

The geographical distribution of the almond tree in Spain corresponds to the region of citrus cultivation and a great part of the olive-growing and vine-growing districts. In the most northerly vine-growing districts it does not grow well or bear fruit except in well sheltered positions. From a horticultural and commercial point of view, it is possible to distinguish three zones where almonds are cultivated: the first is Cataluña where the principal centres are in Tarragona, Barcelona and Lérida; the second includes all of the east of Spain, this is by far the most important and includes the Balearic Islands, parts of Alicante, of Murcia, of Valencia and of Almería, whilst the third is in Andalucía (Granada, Málaga and Huelva).

From 1922 to 1935 the area covered by regular plantations increased by 82,273 hectares, that is to say, by an average of 5,877 hectares per year. Since 1935 there have been no official statistics available but it is estimated that at the present time the area has reached about 170,000 hectares.

In 1935 the number of almond trees cultivated in the regular plantations was 22,400,000 representing a density of 146 trees per hectare. This density

is however very variable ranging from a minimum of 100 trees per hectare in Sevilla, Huelva and the Balearic Islands (where the almond is associated with the olive) to a maximum of 400 in Alava, Burgos, Las Palmas and Leon. It is however to be noted that in the provinces where this cultivation is practised with care the density does not exceed 150 to 160 trees per hectare.

In 1935 the number of almond trees growing alone was more than 9,100,000 which corresponds to 61,000 hectares of regular plantations.

The average annual production of almonds in recent years was 150,000 metric tons which corresponds to 980 kgs of almonds in shell per hectare or 6.7 kgs per tree in regular plantations and a general average of 5.6 kgs per tree if isolated trees are considered as well. This production was valued at 135,000,000 pesetas and about 60 per cent. of the production is exported whilst the rest is used locally for a variety of purposes.

Climate and Soil Conditions.

The most suitable climatic conditions for the almond tree are to be found in the south, except where fogs and white frosts are frequent, and in sunny districts generally. It grows best in a uniform and warm climate and particularly when these conditions occur in the early spring. In fact the limiting factor for almond cultivation in Spain is cold. Low temperatures in themselves have no bad effect on the almond tree which is very resistant to cold but late frosts may play havoc with the blossom which opens very early. The cold has also ill effects on the young fruit, particularly if there are frosts when the fruit are moist. In this respect, the hard-shelled varieties are the most hardy.

The almond tree grows rather slowly, it develops best in light soils especially if they are dry, well drained, stony and have a high lime content. The lime ensures the formation of lignin and improves the quality of the fruit. In Spain good results are obtained on all sorts of land, both sandy as well as chalky, provided only that it is deep enough to allow the development of the root system but, on the other hand, clayey soils and moist soils are not at all suitable and in these conditions the trees are very subject to gummosis.

The almond plays an important part in the fixation of soil; the trees when they are planted, by means of their numerous running roots, hold the thin covering of turf that covers the hills and prevents it being washed down to the valley by the heavy rains. Like the olive tree, the almond tree, does not require a rich soil and so enables arid slopes, which would otherwise be of no value, to be economically exploited.

Like all other cultivated plants it requires considerable care and attention if good crops are to be obtained regularly. In this connection it must not be forgotten that in moist soils the tree only makes a poor growth and is subject to disease whilst in very fertile soils the tree grows vigorously but produces little fruit. In fresh soil the almond tree grows well when grafted on a plum stock and of all the varieties, those with a brittle shell are the most exacting in their soil and cultural requirements.

TABLE II. — *Area and Production of Almonds in Spain*
(Average 1933-1935)

PROVINCES	Regular plantation		Number of scattered trees	Total almond trees	Production (quintals)	Value in pesetas
	Area (hectares)	Number of trees				
Albacete	370	56,980	98,670	155,650	6,226	529,210
Alicante	30,800	4,803,950	1,509,345	6,313,295	378,745	29,702,750
Almería	3,500	735,000	597,620	1,332,620	42,644	4,600,840
Badajoz	150	18,750	46,800	65,550	3,277	327,700
Baleares	40,020	4,008,600	811,000	4,819,600	360,830	27,820,500
Barcelona	3,115	623,000	271,700	894,700	35,800	3,936,750
Burgos	34	13,736	40,291	54,027	5,403	486,270
Cádiz	193	28,950	45,717	74,667	8,960	985,600
Castellón	6,950	1,400,000	324,148	1,724,148	86,060	7,780,500
Córdoba	408	97,920	32,449	130,369	26,074	2,242,364
Cuenca	51	10,200	195,100	205,300	6,159	585,105
Géróna	49	7,350	25,333	32,683	2,288	297,440
Granada	15,230	2,362,000	260,180	2,622,180	68,420	4,915,800
Huelva	2,740	274,000	1,314	275,314	33,038	2,477,850
Huesca	2,407	493,400	1,107,913	1,601,313	64,053	4,483,710
Jaén	300	45,000	105,000	150,000	7,500	562,500
Las Palmas	900	300,000	40,950	400,950	12,328	841,960
Lérida	1,005	169,845	1,090,275	1,260,120	37,804	3,534,674
Logroño	1,005	169,845	61,300	61,300	12,260	1,042,100
Madrid	48	9,600	15,600	25,200	680	47,600
Málaga	2,425	291,000	802,406	1,093,406	21,868	1,908,120
Murcia	32,100	4,815,300	427,150	5,242,450	188,620	19,740,500
Navarra	47	9,212	23,710	32,922	3,951	296,325
Salamanca	710	196,670	208,000	404,670	28,327	2,200,160
Sevilla	160	16,000	6,600	22,600	1,808	216,960
Tarragona	3,500	560,430	340,921	901,351	81,450	9,910,600
Téruel	65	9,750	23,000	32,750	3,602	403,424
Toledo	252	45,360	28,850	74,210	1,454	87,550
Valencia	3,589	663,965	79,847	743,812	66,943	6,024,870
Valladolid	60	15,000	75,830	90,830	4,541	385,985
Zamora	60	15,000	118,000	118,000	2,360	271,400
Zaragoza	1,730	228,360	24,858	253,218	7,597	759,700
Other provinces	31	5,492	299,532	305,024	18,577	1,855,625
TOTALS . . .	152,999	22,374,820	9,139,409	31,514,229	1,629,377	141,478,448

Planting and Cultivation.

The seeds are planted in a nursery; in warm regions this is done in September or October, in temperate regions in December and in colder regions in March. Almonds intended for use as seed are generally germinated in sand for one or two months before sowing. When the embryo makes its appearance, they are taken out and planted point downwards in the nursery at a depth of 4-6 cms, 50 cm apart and 70 cm between rows; preliminary germination may be avoided by breaking the shell which ensures rapid germination. Sweet and bitter almonds with hard shells from strong prolific trees are used for seed. In several regions sweet almonds are not grown from seed as the trees so obtained have seldom the vigour or long life of bitter almond trees. There are bitter almond trees known that are more than a century old.

Soft-shelled almonds are used when free growing trees are required.

After the first year the lateral branches of the young plants are removed in the winter and only one vertical shoot is left, this should be as straight as possible. Generally, after three years in the nursery, according to the growth of the plant, the trees are transplanted to the permanent orchard. The holes for planting the trees are as a rule 60 cm \times 60 cm \times 60 cm deep. It is unnecessary to water the almond tree on transplanting or immediately after for it is enough to be in contact with slightly moist soil for the tree to take root. The tree is very resistant to drought whilst an excess of moisture on the other hand can do much damage.

The spacing of the trees in the plantation depends on the variety, the nature of the land, the position of the orchard and the type of cultivation (whether alone or in association with other crops). Generally, it varies between 6 m \times 6 m (*i. e.* 275 trees per hectare) to 8 m \times 8 m (*i. e.* 160 trees per hectare); in some cases a spacing of 10 m \times 10 m (*i. e.* 100 trees per hectare) may be adopted. The first spacing is used on very poor and shallow soils or on slopes; the second, which is most usual, is practised on flat land where the soil is deeper, whether it is calcareous or sandy; the third spacing is adopted when the almond is grown in association with either the vine or the olive. The usual arrangement is in rows where the spacing between trees may or may not be equal to the spacing between rows. In most districts the planting takes place in autumn, *i. e.* in November.

Although the almond is, as has already been pointed out, a hardy tree and one that does not require irrigation, it is however advisable, if good crops are to be obtained, to work the soil twice a year, at the beginning of the winter and at the end of the winter so that the rain may be held by the soil. Two or three harrowings during the summer are also beneficial.

Manuring.

Manuring is a cultural practice that is often neglected in spite of its extreme importance in ensuring a good yield. An almond tree, badly manured does not give an abundant yield and it becomes old prematurely; the bark be-

comes rough and of a dark colour and the tree is susceptible to a number of diseases. Lack of nitrogen is shown by a poor growth of buds in April and May and in spite of blossoming and pollination, a large number of the flowers fall. Lack of phosphoric acid causes a weakness of the soft wood which lignifies very badly and the buds degenerate. A lack of potash can be seen in years of large crops, the kernels being few and dry. If there is a shortage of iron the foliage is chlorotic; an application of a kilo of iron sulphate per grown tree or a half kilo for younger trees remedies this trouble. Finally, the almond tree needs lime for it shows a marked preference for chalky soils and lime also decomposes organic manures more rapidly.

In well cared for almond orchards 10,000 kilos of good farmyard manure are applied every third year and this manuring is supplemented in the other two years by 250 kg of Chile saltpetre or 200 kg of sulphate of ammonia, 150 kg of superphosphate (18-20 per cent.) and 80 kg of potassium chloride. The fertilisers should be applied at the beginning of the winter except for the nitrate which can be applied at the beginning of the growing season. When nitrate is used it may be applied in two dressings but sulphate of ammonia is better applied all at once. In regions where farmyard manure is not available, green manuring is practised every third year and for this purpose a leguminous crop that thrives in the region in question is grown and ploughed in with 300-500 kg of lime, in the other two years 200-250 kg of superphosphates and 100-150 kg of chloride of potash may be applied.

In some regions the colour of the foliage is taken as an indication of the necessity or otherwise of manuring, if the foliage is dark green no manure is applied, if, on the other hand, it is a light green, farmyard manure is applied mixed with 5 per cent of ashes and 2 per cent. of iron sulphate, when the leaves are yellow lime is applied with iron at the rate of 1 kg per tree fully grown or $\frac{1}{2}$ kg for younger trees.

Propagation.

The almond is propagated by seed or by grafting. Generally it is preferred to grow new plants from seed and graft them subsequently for trees grown directly from seed have a tendency to degenerate.

The root stocks are bitter almond, hard shelled sweet almond or else plum. The first are to be preferred in dry districts with a calcareous soil whilst the trees on a plum stock have the advantage of being able to be planted on fresh soils or soils deficient in calcium and having a clayey subsoil; such trees are not so long lived as the former.

The methods of grafting employed are shield budding with a dormant bud (in August-September) with a growing bud (in May) and cleft grafting.

Budding with dormant buds is carried out on the trees in the nursery 10 cms above the ground and generally in August. Shield budding is one of the different bud grafting methods in which the scion is made up of a bud on a small strip of bark; it may be carried out either with growing or dormant buds: the first method being used for chestnut, mulberry and walnut and the second for almond, peach plum, cherry, apple, pear, etc.

Shield budding enables the grafting of very young subjects; the operation is simple rapid and more likely to succeed than any other method. Shield budding can only be carried out when the sap is up but it is essential that this be not too abundant; in general it is practised in spring when the sap rises (shield buds that develop quickly, the so-called growing buds) or at the end of the summer or the beginning of autumn when the sap is falling (shield buds that develop slowly, the so-called dormant buds). The latter method is most frequently used.

The root stocks most generally used are the free-growing almond, the plum and the apricot, the latter, however, only to a small extent. The free growing almond, that is an almond tree grown from seed, is preferred by the nurserymen on account of its affinity for all varieties and it is the classic root stock for calcareous soils where the almond grows best.

As a rule the tree bears fruit three years after grafting, that is to say five years after sowing.

Free rooted almond trees are the first to bloom, the hard shelled varieties develop before the soft shelled varieties and the latter before the bitter varieties.

The blossoming of the almond tree depends not only on the variety, the position of the tree, the height of the orchard but most of all on the season. If the temperature is maintained uniformly, (8-10 degrees for several days) the flowers appear. The tree is in bloom for 3 to 4 weeks. In Spain flowering usually takes place between January and March whilst the fruit ripens in August-September.

Pruning.

The almond tree will not stand hard pruning which shortens the life of the tree. Pruning properly speaking is only carried out when the tree is forming and is a question of leaving only 3 or 5 well spaced branches, equidistant from each other, so that the sap on rising is distributed evenly throughout the tree. The tree should be pruned to give it a round goblet shape and for this the branches are given an inclination of 45°. The tree should be kept hollow and crossing branches where they interfere should be removed towards the months of November and December.

Once the tree is formed, a light pruning is given in November every other year in order to remove branches that are aging or breaking up the desired shape. Some growers prune their trees immediately after harvesting for at this time the branches still have their leaves and it is easier to notice dead and diseased branches and to remove them.

To rejuvenate old trees the master branches are cut back to a half or third and extra vigour is given the tree by working the soil in winter or spring and giving a good dressing of manure.

Varieties.

In Spain almost all the known varieties are to be found and many of them hybridise amongst themselves spontaneously in the provinces Ciudad Real, Extremadura, Andalucía, etc. There are also a number of varieties that have

not always an absolutely fixed character undoubtedly owing to the multifarious crossings that have taken place and still continue by the agency of insects at the time of blooming. For this reason it is difficult to establish a systematic classification. On the other hand, there is still real uncertainty as to the naming and possible duplicate names of the different varieties. In many cases the same variety goes by different names even in the same region. Further, some workers have classified them according to the hardness of the shell, (hard medium and soft shell varieties) whilst others have based their classification on the time of flowering (early, normal and late).

In general, however, all may be attached to one or other of the great groups: (1) *Amygdalus communis amara*, endocarp hard and kernel very bitter, the latter is smaller than that of the sweet almond; (2) *Amygdalus communis dulcis*, endocarp hard or fairly so and the kernel sweet; (3) *Amygdalus communis fragilis*, endocarp soft and kernel sweet; (4) *Amygdalus communis persicoides*, leaves larger than the preceding, the endocarp thin and easily bifurcated. This last is in all probability, a hybrid of the almond and peach, the fruits of this group are oval and have little juice; they resemble in some respects almonds and in others peaches. The almond, *Amygdalus nana* might also be mentioned, it is a shrub that grows to a height of 30 cms and gives a fruit with a broad point. It is cultivated as an indoor ornamental plant.

The first group—the bitter almonds—from which the others have probably developed is very hardy and vigorous. It grows and fruits in Spain in all latitudes, six varieties are distinguished. The second and third groups (sweet almonds with hard medium or soft shells) form at the present time the basis of Spanish almond growing for, in recent years, the trade has demanded soft shelled almonds, the fourth group is comparatively rare.

A large number of varieties of sweet almond are known, a brief description of those most ardely cultivated will be given below.

“*Pestañeta*” tree, 5—7 m. high; flowers, deep pink and resistant to cold; fruit, more oval than that of other varieties. This variety is mostly cultivated in Alicante and the other eastern provinces.

“*Mollar*”: tree, fairly vigorous; flower, late, corolla of six petals (other varieties have only five), pink and more brilliantly coloured at the base, fruit, large and sweet, shell soft and breaking easily when pressed between the fingers.

Soft shelled almond or “*Little Mollar*”: tree, medium size; flower, small with petals longer than their breadth; fruit oval. This is an exacting tree but much appreciated; it is in fact classed among the medium fine varieties.

“*Persico*” almond: probably a hybrid of the almond with the peach; different fruits are found on the same tree.

“*Desmayo*”: tree, very vigorous and elegant, very prolific and resistant, to cold because the blossom is protected by adequate foliage; flower, late; leaves, broad; fruit, very large and elongated with a very hard shell. The almonds are of a superior quality and it is widely cultivated in Cataluña where the almond harvest is sometimes jeopardised by late frosts.

“*Common*” variety: tree, vigorous; made flowers resemble those of the bitter almond. This tree is very resistant to adverse conditions and

includes many sub-varieties encountered in different parts of Spain. The fruit is hard shelled.

"*De Damas*": tree, vigorous with a good appearance, very prolific and much appreciated in warm climates; fruit, medium shell, in great demand on the markets. This variety is cultivated particularly in coastal regions where it gives a regular production.

"*Primera*": tree, vigorous requiring much attention and care; fruit, long with a brittle shell. The fruit of this tree commands high prices.

"*Larga de Málaga*": this variety is cultivated to a considerable extent in the north of Spain and produces very long almonds that have an almost cylindrical shape. They are of very good quality and have an excellent flavour and command the highest prices in the markets.

Besides these varieties there are others of which a few might still be mentioned: "*Marcona*", which has a fairly large fruit, "*Esperanza*", which is cultivated particularly in Taragona and much in demand in foreign markets on account of its high quality; "*Bale*", which has longer and sweeter almonds than "*Pestañeta*"; "*Planeta*"; "*Pintada de Mallorca*"; "*Racimo*", "*Legona*"; "*Levante*"; "*Diminuta de Canarias*", which has almonds only slightly larger than a bean; these almonds are roasted to make a very fine dessert; "*Valbuen*", another choice variety and many others.

The hard shelled varieties are more prolific than the others but the almonds are less in demand.

For several years the producers have endeavoured to obtain late blooming varieties in order to avoid the danger of the white frosts in March and April. The almond blossom is much more resistant to a dry frost.

Mixed Cultivation.

It has been said above that the almond may be cultivated alone or in association with other plants, annuals, such as wheat, barley oats, beans, chick peas, etc. or perennials (vines or olives). One of the factors that prevent the almond tree from yielding the best results is the bad practice of growing it in association with cereals, particularly with barley and oats. These crops draw on the soil moisture during the critical months from March to May to such an extent that the association is injurious not only to the almonds but to the cereals themselves. In any case where this association is used it is necessary to work the soil after harvesting the cereals.

If the almond is well cultivated it is sufficiently profitable to render other crops unnecessary. When, however, inter-cropping is practised it is necessary to use a well thought out rotation such as the following: 1st year, beans, vetches, lentils, chick peas; 2nd year, barley and vetch for fodder or oats and peas for fodder, 3rd year, *Vicia monantha* Koch.

Harvest and Yield.

Picking takes place in August or September according to the district. If the almonds are to be eaten unprepared or mixed with syrups or confectionery, they must be picked by hand before they are ripe. In other cases the fruit

is collected when the pericarp opens and this may be effected either by hand picking or by beating the trees; with soft shelled varieties the trees are simply shaken.

The almonds are put into sacks or baskets and taken to the sheds where the pericarp is removed and the almonds are laid out in the sun for three or four days for the shell to acquire the golden colour that is desired by the buyers. The mean weight of a hectolitre of dry almonds is about 33 kg for soft shell varieties and 45 kg for hard shelled varieties. The almonds are then graded according to size. Hard shelled almonds must be sold shelled and so the shells have to be broken. Shelling almonds may be done by hand or mechanically, and it is usually reckoned that 100 kg almonds yield 28 kg of shelled nuts. The weight of the kernel without its shell is from 2 to 6 g.

Almonds must be kept in a dry place without being exposed to the sun or heat; sunlight changes their colour and heat dries them up.

An almond tree gives a reasonable yield in its seventh year (2-3 kg per tree) and the maximum production is reached between the 25th and 35th years (12-20 kg per tree). The life of an almond tree depends greatly on the care and attention that it receives and of course on the variety.

A well tended almond orchard can be very profitable. Differences in production between one region and another and even between one plantation and another in the same region are easily seen. In a neglected plantation, yields of 3 kg per tree are obtained whilst well cared for trees may yield 15 to 20 kg; these figures correspond to gross incomes of 400 and 3,600 pesetas per hectare respectively.

An almond tree remains in production as a rule for about forty years after which it falls off.

Diseases and Parasites.

The principal disease of almond trees in Spain is gummosis. Most often this is a result of lopping, pruning, excessive moisture, a sudden fall of temperature sending the sap back, old age, etc. Almond trees planted in moist soils or in places very subject to spring frosts are much attacked by gummosis. The treatment for an affected tree is to remove the gum with a clean cut, then to wash the wound with vinegar and salt and then to cover it again with mastic. Longitudinal incisions are then made under the wound, at the bottom of the master branch attacked and then along the trunk in order to allow the gum to flow.

Leaf curl of the almond is identical with the similarly named peach tree disease. It is caused by the fungus *Exoascus deformans* which attacks either tree. The treatment is spraying with a neutral Bordeaux mixture containing 1.5 per cent. of copper.

The chief insect parasites that damage almond trees are the following

Capnodis tenebrionis. This insect attacks the less vigorous trees and bores galleries under the bark; the galleries are transversal and often circular. This insect is kept off by repeated cultural measures and by the application of manures and, if need be, by irrigation.

Kermes amygdali or *Lucanum amygdali*, the scale insect is difficult to control; the adult insects secrete honey dew which attracts the ants and is the precursor of sooty smut. The only possible control measure is to scratch the trees and wash them with a strong insecticide.

Aphis amygdali, the almond aphid is analogous to the corresponding peach parasite. It is one of the smallest of the aphids, being only $\frac{2}{3}$ mm. long and it multiplies at a prodigious rate. As a control measure pyrethrum powder is recommended, scrubbing and spraying with other insecticides are also successful.

Trade.

Exports of almonds, although they have diminished considerably since 1930, have been maintained at a level of 800,000 quintals in shell, equivalent to 224,000 quintals of shelled almonds, for the last few years; this trade represents a value of 37,000,000 gold pesetas.

The principal destinations for Spanish almond exports are the following.—the United Kingdom (34 per cent. of the total), France (25 per cent.), Germany (15 per cent.), United States (11 per cent.), Sweden (4 per cent.), the Netherlands (2.5 per cent.), Canada (1.8 per cent.).

The world price of almonds is almost always regulated by the harvest in Spain and Italy. Soft shelled almonds are most in demand and these are sold by weight. Internal prices fluctuate from 80 pesetas per quintal for almonds in shell of inferior quality to 150 pesetas for those of good quality; export prices vary round about 170-185 gold pesetas for shelled almonds. Spain imports no almonds.

Uses.

This tree, which grows in poor soils, is the basis of a profitable industry. The almond is put to many uses, it makes its appearance at table as a dessert and is used in the kitchen and in the manufacture of confectionery; it also has medicinal and even industrial applications.

The tree itself is an excellent root stock for most stone fruits, particularly the apricot and peach.

The wood is of a good colour and much in demand for cabinet making, turning and wheel-making; the foliage provides excellent fodder for animals and especially for sheep and goats which eat it readily. The growers feed the foliage to their stock as it falls.

The pericarp is the basis of a home potash industry. The ash contains 45-55 per cent. of potash which is recovered by the growers themselves in primitive furnaces. A metric ton of pericarps yields 120 kg of ash or 60 kg of potash (calculated K_2O) which is used in the preparation of concentrated lye or for the preparation of potassium carbonate by extraction.

The mesocarp is used as fuel and the ashes are used for manure for they also contain 50 per cent. of potash but the shells have an ash content only one twentieth of that of the pericarp.

Sweet almonds are nourishing and tasty fruit and are eaten dry or green as dessert, the latter are much in demand as primeurs in June whilst the others are eaten, roasted or not, as winter fruit.

When the almonds are to be eaten fresh, they are picked whilst still green; they are also used when picked this way for making sweets, etc

Dried almonds are eaten as they are or roasted. Sweet almonds have a pleasant flavour particularly if the perisperm which contains tannin is removed. According to KÖNIG, almonds contain 6.02 per cent. water 23.49 per cent. nitrogenous matter 53.2 per cent. fat and oil, 7.84 per cent. non-nitrogenous aqueous extract 6.1 per cent. crude fibre and 3.12 per cent. ash. The oil content varies from 43.56 per cent.

Bitter almonds are indistinguishable botanically from sweet almonds but they differ by containing 3.3 per cent. or even more of a bitter glucoside amygdalin. When the almonds are crushed with water, the amygdalin decomposes into oil of bitter almonds (benzaldehyde) prussic acid and glucose under the action of emulsin. According to KÖNIG, the composition of bitter almond is 5.5 per cent. water, 34.36 per cent. nitrogenous matter (including the amygdalin) 42.8 per cent. fat and oil, 14.4 per cent. non nitrogenous extract and crude fibre and 3.2 per cent ash. The percentage of oil and fat varies from 36 to 50 per cent.

A great part of the almonds produced in Spain is used in confectionery and sweet making, the manufacture of nougat is a great seasonal industry in Spain whilst other confectionery in which almonds are used include sugared almonds, almond creams, biscuits and cakes.

Crushed almonds are used principally for the preparation of almond milk, syrupy liqueurs and emulsions, the paste remaining after the extraction of oil by cold pressing is also used to replace cacao in the preparation of inferior chocolates and other confectionery.

Milk of almonds is prepared as follows. The perisperm is removed and the nuts are ground or crushed with an equal weight of sugar and a little water so that a fine paste is obtained which is further diluted with water so that there are 2 litres of water for every 100 g almonds; it is then strained and the resulting liquid is a very agreeable drink with curative properties, it is effective against inflammatory diseases, coughs and colds.

In general almonds are widely used in medicine, pharmacy and perfumery. The principal products made are, oil of sweet almonds (40 per cent. yield of oil) an inodorous liquid with a light yellow colour and a sweet taste; it is transparent and consists almost entirely of triolein; it is used pure as a laxative and in the treatment of bronchitis and coughs, phlegmatic infections of the stomach and intestines, the respiratory tract and the urinary ducts. It is also the base for the preparation of many medicinal oils, creams, soaps, plasters and cosmetics. It is also used in the preparation of oleo-calcareous liniments (similar to Carron oil) and cold cream.

Almond paste is obtained from the powder that is obtained by drying the oil cake after expression of the oil; these cakes are also used for the feeding

TABLE III. — *Almond E*

Country *	Shelled Almonds					
	Exports (quinials)			Value (gold pesetas)		
	1933	1934	1935	1933	1934	
Germany	23,609	39,736	49,425	4,135,506	5,445,456	
Algeria	625	772	778	92,825	93,464	
Argentina	4,129	4,368	5,484	866,545	751,878	
Australia	570	649	888	102,482	115,030	
Belgium	1,622	2,722	3,999	289,317	395,947	
Brazil	230	417	297	45,174	64,976	
Canada	4,363	4,565	3,788	806,629	696,502	
Colombia	14	19	43	4,405	5,417	
Cuba	1,187	1,714	1,102	225,381	305,815	
Chili	14	18	23	3,596	3,997	
Denmark	1,237	2,073	1,964	227,938	319,863	
Egypt	53	262	831	6,638	43,065	
U S A	13,904	12,457	34,343	2,780,857	2,276,799	
France	19,617	29,989	27,681	3,371,710	4,180,422	
Guatemala	8	5	4	2,500	1,387	
Italy	444	1,839	1,560	77,254	226,453	
Japan	—	—	—	—	—	
French Morocco	57	89	94	9,566	7,036	
Mexico	1,310	1,346	1,312	246,765	220,398	
Norway	1,440	2,124	2,243	228,799	334,698	
New Zealand	—	—	32	—	—	
Panama	182	223	260	43,924	43,058	
Netherlands	6,522	6,022	5,692	1,204,041	942,047	
Peru	16	38	20	3,581	6,729	
Portugal	—	1	220	—	223	
Dominican Republic	—	—	6	—	—	
Roumania	57	201	63	10,157	33,040	
United Kingdom	68,972	80,180	81,866	12,513,016	11,800,878	11
Sweden	7,943	8,874	14,585	1,434,862	1,363,704	2
Switzerland	1,373	409	2,008	238,032	62,576	
Tunisia	182	—	147	32,140	—	
Union of S Africa	5	—	10	1,064	—	
Uruguay	322	107	138	71,155	16,453	
Venezuela	20	31	33	5,997	6,603	
Yugoslavia	—	—	122	—	—	
Other Countries	610	628	2,278	107,277	91,186	
TOTALS	160,637	201,878	243,339	29,189,133	29,861,100	

* Countries are arranged in alphabetical order of their names in French.

ing 1933-1935

Almonds in shell						Country
Exports (quintals)		Value (gold pesetas)				
1934	1935	1933	1934	1935		
536	4 300	2,190	270 162	224 283	131 240	Germany
519	1 806	1 902	35 014	104 323	97 218	Algeria
110	5 282	8 655	368 241	321 484	514 664	Argentina
559	378	384	30 155	18 080	31 551	Australia
339	227	607	24 305	12 956	37 195	Belgium
108	610	405	102 086	44 766	29 673	Brazil
352	3 584	3 148	174 300	177 747	167 644	Canada
7	125	223	356	22 411	17 905	Colombia
5	451	313	346	36 647	20 452	Cuba
108	833	1 514	41 166	45 542	84 327	Chili
196	103	12 581	30 672	5 095	687 216	Denmark
593	19 154	13 710	703 760	1 016 747	798 956	Egypt
22	2 823	636	128 013	170 001	46 236	U S A
24	—	—	1 500	—	—	France
118	1 153	528	119 735	65 289	25 792	Guatemala
7	177	72	3 408	15 373	8 970	Italy
51	72	112	3 637	3 635	8 639	Japan
5	6	3	774	358	205	French Morocco
36	103	353	870	6 133	20 298	Mexico
1	5	13	157	442	717	Norway
11	1	44	—	54	6 949	New Zealand
11	15	57	745	836	4 326	Panama
1064	—	13	—	—	1 310	Netherlands
93	12 563	5 537	552 496	660 487	306 265	Peru
172	126	48	7 086	11 166	3 915	Portugal
39	81	334	8 128	6 947	20 176	Dominican Republic
4	389	15	44 825	20 854	883	Roumania
183	—	155	290	—	6 998	United Kingdom
2	60	192	11 696	3 511	13 277	Sweden
378	2	49	133	233	4 181	Switzerland
500	—	—	—	—	—	Tunisia
	4,706	6,477	220 133	237 086	376 052	Union of S Africa
	59,135	60,303	2,976,189	3 232,886	3,481,299	Uruguay
						Venezuela
						Yugoslavia
						Other Countries
						TOTALS

of cattle, oils and perfumes may be added to the paste which may then be used for making soap and cosmetics.

The oil and essence obtained by pressing bitter almonds cold are both used in perfumery and in the preparation of liqueurs. Almond liqueur is prepared as follows 240 g bitter almonds are crushed a paste in a mortar and lixiviated with 6 l cognac or good brandy for 15 days, the liquor being agitated every morning, 2 kg sugar, 50 mg essence of rose 50 g orange flowers are added, The liqueur is then filtered and bottled.

Conclusions.

From what has been said in this article the following conclusions may be drawn —

(1) The cultivation of almonds in Spain enables many poor and arid soils that are not suited to other purposes to be exploited profitably and during the last fifteen years this product has grown in importance. In the near future there will be a considerable natural increase in production as the result of the laying out of new plantations of which 70,000 hectares are not yet in full production.

(2) In order to avoid losses by frost in certain regions the growers are trying to develop late flowering varieties and this also is leading to a noticeable increase in production.

(3) There are still further districts in which almond culture can be further developed.

(4) It would be useful to have a systematic classification of the varieties cultivated in order to standardise the fruit and gradually to eliminate the unproductive hard-shelled varieties, the fruit of which has fallen off in value.

(5) Up to the present the production has been easily absorbed by internal consumption, which is considerable, and exports.

(6) The numerous uses to which the almond can be put removes fears that might be occasioned by an increasing production; however, during recent years many other substitutes have competed with the original product (walnuts, hazelnuts and even apricot and peach stones) and this has caused a fall in the world price of almonds.

(7) In view of the slump in vine and olive culture in recent years, almond cultivation, which is rather a family business, has proved remunerative in a number of dry regions where other crops would not prosper.

A. PASCUAL.

PRESENT-DAY PROBLEMS IN ANIMAL NUTRITION

We propose, in a series of articles devoted to the subject of animal nutrition to draw attention to the most striking investigations and practical trials that have been made in this field during recent years and to indicate the lines along which they are developing

The series of articles which we are about to publish has been prepared at the request of the XIVth General Assembly of the International Institute of Agriculture (May 23rd to 28th, 1938)

“ The General Assembly

in view of the importance of the rational feeding of livestock in the reduction of the costs of production and in the improvement of the quality of foodstuffs of animal origin, milk and milk products, meat and eggs

invites the Permanent Committee to direct its work on nutrition not only towards questions relating to the production of foodstuffs for human consumption but also to the problem of the rational feeding of livestock

Further, the General Assembly,

recognizing that a great volume of scientific work is being conducted in many countries

asks the Permanent Committee to consider the desirability of action for the coordination of this work and for the interpretation of its most important findings in practical terms which can be applied by farmers ”

These articles deal with present-day problems connected with animal nutrition and will offer a review of the most important results obtained recently through experimental research and practical tests they will also illustrate the progress of the problem of feedingstuffs and its repercussions on stock-breeding.

In the past the International Institute of Agriculture has several times studied questions of this nature, it is now proposed to make a systematic study of the changes in feedingstuff production and of the development of animal nutrition

As the subject of our first article we have selected the present tendency in each individual country to use home-grown fodder for livestock This is a new trend of paramount importance and is connected with the self-sufficiency policies adopted in many other fields which have led to such radical alterations in fodder production and dietary methods This trend may be viewed as a reaction against the tendencies prevailing up to the present namely, to obtain maximum yields through the use of suitable feeding stuffs without regard to their origin and at the same time to reduce production costs Since, on the other hand, the widest possible use of home-grown fodders is now considered essential a large amount of scientific work will obviously have to be done to establish a suitable basis for these methods of production

In this first article an endeavour will be made to give a methodical classification of the different methods of reaching the above mentioned aim. Limited space prevents a thorough treatment of all the questions involved and a too long description would also make it impossible to give a clear and exact summary of the whole. For this reason only certain problems that enter into the body of this study can be treated in detail.

SELF-SUFFICIENCY IN FODDER SUPPLIES

I — Description of the problem.

In a chapter of the volume entitled *World Production in Meat* (1), published by the International Institute of Agriculture (Rome, 1938), a detailed study is made of the evolution of the basis of animal production and especially of animal feedingstuff supplies. In this study it was shown that, since the end of the XIXth century, the western, northern and central European countries—namely, those where livestock production is most progressive—have shown a steady increase in imports of feeding stuffs from those regions where conditions are particularly favourable and yields are large.

Consequently, stimulated by the intensification of international trade, a system of division of labour began to take shape. Since the areas situated in the vicinity of the large centres of consumption were being devoted increasingly to raising livestock, the number of animals multiplied to such an extent that the fodder produced in these areas was insufficient to meet the demand and it became necessary to apply to countries overseas and in Eastern Europe for the foods of which there was a shortage. This development was also favoured by the thorough study of the food requirements of animals in relation to yields and of the nutrient values of the different feeding stuffs. In this way it became possible to obtain unexpectedly high yields from the animals and, at the same time, to make the best use of native fodder by the addition of imported feeding stuffs.

A large number of the countries which originally adopted this system for ensuring their supply of animal feeding stuffs have, for some years now, shown a tendency to change their methods. The difficulties encountered by world trade, its consequent decline and the rise of new economic ideas, including those connected with self-sufficiency policies in particular, have all exerted a considerable influence on this evolution. Several countries, especially Germany, have founded their production of livestock on self-sufficiency principles and have attempted to organize stockbreeding on a basis of animal feedingstuffs produced almost exclusively within the country. It should be added, however, that economists appointed to study livestock production from the aspect of self-sufficiency soon discovered that a considerable number of so-called national products are only apparently autarchic, as their preparation involves the use of large quantities of foreign fodder.

It is obvious, however, that a change must be made in the diet system formerly in use in order to put the above principles into practice or at least to make an attempt to do so.

Much research work and numerous experiments have been carried out in this connection during the past few years, especially in Germany. Since satisfactory results have often been obtained, several countries which were formerly dependent on foreign countries for their feedingstuffs have now been able to effect a steady increase in their home products together with a reduction of imports.

While countries which had adopted a self-sufficiency policy practised the new system in all its details, other more conservative countries were nevertheless induced to make some innovations in both diet and production. Under present circumstances, owing to the obstacles to world trade created by the war, the results obtained are of interest to all countries—whether belligerent or neutral—where the shortage of animal feedingstuffs is beginning to be felt.

It is not within the scope of this article to make an exhaustive study of the economic causes which have led to the present state of progress (1) (2), nor yet to describe the advantages attributed by its partisans to the system of feeding livestock on home-grown fodder as against the system which formerly prevailed. The present intention is rather to study the technical aspects of the problem and its possible solutions.

OBJECTIVES OF A SELF-SUFFICIENCY POLICY IN THE NUTRITION OF LIVESTOCK AND DIFFICULTIES ENCOUNTERED IN ITS APPLICATION.

The objective towards the attainment of which every effort is being exerted may be summarized as follows: to provide livestock with home-grown animal feeding stuffs, or, in other words, to eliminate dependence on foreign countries in this respect as completely as possible, without reducing the amount and quality of existing animal products but, on the contrary, doing everything possible to maintain a steady increase.

From the above definition it will be seen that the problem presents a different aspect according to country. The essential features characterizing the production of livestock, crop yields and the volume and quality of fodder crops are determined in each individual country by special conditions dependent on the nature of the soil and climate, economic and social situation and political organization. All these external factors determine how and to what degree the existing production of animal feedingstuffs can be intensified and balancing these factors provides the most difficult problems in connection with the supply of home-grown fodder.

Statistical averages of imports over a period of several years show which kinds of feedingstuffs were formerly imported and must now be replaced. The list includes feedingstuffs whose production in the country itself is either impossible or reduced to a minimum for economic or climatic reasons or because of unsuitable soil conditions.

Imports consist, as a rule, of concentrated animal feedingstuffs; *i. e.* those with a large nutritive content in proportion to their weight, so that their value justifies the cost of transport which is often heavy. In most countries which import large quantities of animal feedingstuffs, the intensification of the output of home-grown produce would only give an increased quantity of fodder crops produced on the farms. What is required, however is, to replace concentrates imported from abroad by home-grown animal foodstuffs and, consequently, certain problems which were of secondary importance as long as unlimited quantities of concentrated foods were available have suddenly become of exceptional interest.

Animal feedingstuffs produced on the farms are as a rule very bulky; *i. e.*, they contain a small proportion of nourishment in comparison with their volume and weight, they also contain large quantities of roughage consisting of masses of crude fibres. These are two factors which must be borne in mind if they are to be used in place of concentrates.

If the appetite of ruminants is to be satisfied, they must be given a certain volume of food and a certain quantity of roughage, from this standpoint, therefore, the substitution in question does not present such great difficulties as is the case with horses, pigs and poultry, whose ration requires a higher concentration of nourishing substances. The art of animal feeding consists, therefore, in making up the rations in such a way that the animal is satisfied but not satiated while at the same time it absorbs the necessary amount of nutritive substances required to obtain an optimum yield.

A comparison of the nutritive principles contained in available home-grown animal feedingstuffs with those contained in the foods formerly imported leads to some important observations. While, at least from the technical standpoint, the supply of carbohydrates presents no difficulty in countries which have adopted a self-sufficiency policy, the same cannot be said as regards proteins. There is not enough sunshine in northern regions for the production of certain plants and especially of those with seeds containing abundant protein. The intensification of fodder crops and rational methods of utilizing meadows and grazing land ought theoretically to supply the required quantity of protein foods within a short time, but as this protein is incorporated in a very large volume of carbohydrates, it is not sufficiently concentrated and, consequently, its use presents obstacles to obtaining high milk yields and rapid fattening of stock. Owing to the difficulty and cost of transport it is also impossible to use it for supplying the less favoured areas.

Another point of interest is that certain foods which are easily obtained on the spot, such as legumes (beans, peas, lupin, etc.), have a protein content which, though high, is qualitatively incomplete from the biological point of view. In order to obtain the maximum efficiency, these products should be combined with certain materials of animal origin rich in protein (skimmed milk, fish or meat meal or powdered blood) or oil cakes.

The problem is still more complicated where cereals suited for animal food have to be completely eliminated or sparingly used; this is the case in Germany where the use of breadstuff cereals for animal nutrition has been prohibited since

June 22nd, 1937, in order to ensure the people's bread supply. This measure, which was not successfully counterbalanced by a temporary increase in maize imports, raises yet another question with regard to feed supplies.

In connection with the feeding of cows giving a high milk yield, Prof. EHRENBURG (3) gives an interesting account of the difficulties encountered as the result of restrictions concerning the use of concentrates containing protein of high biological value. "... Now that oilcake imports are prohibited, our peasants can no longer mix a ration allowing of a daily milk yield varying between 15 and 20 litres by the mere addition of a concentrate rich in protein to the basic ration which is only sufficient to give a daily yield of 8 litres. The theoretical methods recommended by KELLNER and those of a practical nature advised by R. GEISSLER, which used to be accepted as a matter of course for an individual ration, often become impracticable. The large quantities of protein necessary to increase the milk yield cannot be obtained by adding hay, silage, cereals or bran to a basic ration drawn from the fodder crops produced on the farm, without making it impossible for the animal to absorb the whole ration because of its high dry matter content.

".... This instance also shows that if feedingstuffs produced on the farm are used for animals during the winter months, it is difficult to estimate the value of the digestible proteins in accordance with KELLNER's system, hitherto adopted; the same may be said in connection with the possibility of satisfying the animal's appetite because, even in obtaining a daily yield of 10 litres from each animal, the fodder would inevitably contain too much carbohydrate, which, besides being expensive, may fatten them excessively.

".... The difficulties described above are not eliminated even when fodders rich in protein are used, such as a good serradelle hay or even wheat bran. It is extremely difficult to obtain the required protein content because the dry matter contained exceeds the limits indicated by KELLNER. If this is observed in connection with the very mediocre yield of 15 litres, it is still less likely that daily yields varying between 20 and 25 litres of milk per cow can be obtained on a diet using fodder as an addition to the basic feeding stuff.

"The possibility of reducing the quantity of the diet and its dry matter content by eliminating straw from the basic feedingstuff should also be considered; this would adjust the ration to higher milk yields but an initial obstacle would be the difficulty of making the peasants understand the change, as they consider that straw must be added to the ration as a matter of course and, up to the present, even cows yielding 20 litres of milk and over have been receiving the same basic ration as the other stable cows. By eliminating straw, rations could be arranged for a yield of 15 litres and it would thus be possible to obtain a content of digestible protein in accordance with KELLNER's principles, in this case, however, fodders rich in protein would have to be used.

".... In working out a ration for a daily yield of 20 litres, difficulties are encountered in connection with the dry substance and starch equivalent even when straw is not included.

Strictly speaking, even in these cases it would be possible to make satisfactory use of fodders produced on the farm by adding concentrates also produced

on the premises, such as brah, crushed cereals, etc. But if yields over 20 litres are required, and this is not an exceptional amount even in herds of medium quality animals, this level often being attained for more than a month at a time without interruption, crushed legumes or oilcake would have to be used and preferably home-produced oilcake. In this case account would have to be taken of the low biological value of the protein content of legumes and $\frac{1}{3}$ or $\frac{1}{2}$ of the ration would require to consist of oilcake. Since national oilcake will soon not be available and since the kind obtained from linseed, which is the best, is indispensable for raising young animals, the only remaining kind will be colza cake, which has a very low protein content and poor hygienic properties. It must therefore be concluded that, if a daily yield of 20 or more litres is wanted, it will not be easy to replace foreign feedingstuffs during the winter unless special measures are taken to grow fodders with a higher protein content".

This new diet system based on home-grown fodders raises similar problems in connection with the feeding and fattening of pigs. The restrictive measures adopted as regards the use of cereals for pig fattening led to a wider use of root crops, but their low content of nutritive principles and especially of protein, involves a more extensive use of foods rich in this substance, because pigs require large quantities of protein. According to RICHTER, a pig requires between 230 and 240 grs. of digestible protein daily. This amount cannot be supplied exclusively from root crops and complementary foods and consequently a special addition of substances rich in protein is necessary, this addition may be composed of crushed legumes but, as has already been said, the biological value of their protein is poor. Some foods of animal origin which are rich in protein must also be added (skimmed milk, meat or fish meal, powdered blood, etc.).

An attempt has been made to fatten pigs by making exclusive use of root crops, the only addition to the diet being some food rich in protein (or sometimes a little chaff), but in this case a very large quantity of protein is required and it has been observed that the pig's health suffers and the animal becomes very sensitive, the digestive organs especially being affected, there have also been some cases of diarrhoea, a trouble which is always to be avoided during the period of fattening.

It is therefore suggested that a certain amount of fodder cereals, such as bran or other by-products of milling, be added to a ration of roots and a food rich in protein. According to RICHTER this supplement should amount to 0.75 kg. daily per pig.

"In the opinion of pig breeders in west Germany, where fattening was formerly based exclusively on fodder cereals, this supplementary quantity of cereals or bran seemed to represent a minimum; in East Germany, on the other hand, where the potato is the essential basis for pig fattening, farmers were often unable to supply the required amount of 1 quintal per pig from their own crop. Further research has shown that it is possible to reduce the addition of cereals and bran to as little as 0.50 kg. daily per pig, and still fatten successfully. Where pulses are used in the supplementary ration, they can be made to replace the fodder cereals to a certain extent, and the proportion of the latter can be reduced still further".

As in the cases of milk production and pig fattening, new solutions have to be sought for feeding horses and for the production of meat, eggs, etc. These solutions are not confined to the field of fodder production nor to the technical aspect of diet. As has been demonstrated above, when the diet is limited to fodders produced on the farm, the hope of obtaining maximum yields must be abandoned. Partisans of the new system insist that this should be borne in mind when selecting animals for breeding purposes and instead of keeping the animals offering the maximum yield, those giving a good average yield from the fodders used should be selected.

The examples mentioned above show how important it is to balance the feedingstuffs available in winter and summer. Moreover, it must not be forgotten that fluctuations in fodder crops are felt much more under a régime of self-sufficiency. Formerly, when there was a bad harvest, the shortage was replaced by increased imports of feedingstuffs; recourse has now to be made to the stocks formed by the surplus of previous harvests.

From this brief account of some of the important problems arising when feedingstuffs for livestock are based on home-produced fodders it will be seen that these problems are numerous and the extent to which animal production is affected will also be realized. A general summary of the methods adopted to attain the end in view will be given in the following chapter.

II — Methods used to attain self-sufficiency in the supply of animal feedingstuffs.

I — MEASURES FOR INCREASING THE FODDER OUTPUT.

The absolute necessity of increasing the present output of fodders is so evident that it is almost superfluous to discuss the matter here. The methods adopted for attaining this end are, as a rule, so well-known that there is no need to explain them in detail and in this article they will merely be enumerated, together with the points of view which are most generally accepted: (a) extension of cultivated areas, (b) increase in yield and more rational use of meadows and grazing lands, (c) increase in fodder crops.

(a) *Extension of cultivated areas.* Fallow land uncultivated or merely badly utilized areas should be reconditioned for farming by the adoption of reclamation methods. By combining the various lots of land belonging to a single proprietor and situated in various localities, both the cultivated area and even the roads and head lands, usually left uncultivated, can be utilized.

(b) *Increase in yield and more rational use of meadows and grazing lands.* — So much has been written on the subject of the improvements to be made in the treatment of meadows and the more rational use of grass that one might almost be tempted to think that a discussion of this point is superfluous. However, all reports, including the most recent, received on this subject from the various countries, admit that hitherto too little has been accomplished in this respect.

Too much emphasis cannot be given to the importance of the areas used as grazing lands for the feeding and maintenance of cattle. Under the self-sufficiency system adopted by several countries, the meadows and grazing lands acquire all the more importance in that they supply the greater part of the necessary protein. GEITH (5) observes, for instance, that by merely improving the green areas in Germany, which represent about $\frac{1}{3}$ of the total area used for agriculture, it would be possible to obtain 6 million tons of supplementary protein, at first sight, this figure might appear somewhat exaggerated but while GEITH and ZURN (7) put the amount of protein supplied for animal food by German grazing lands at a little over 60 per cent., KLAUDER (6) estimates it at 70 per cent.

Prof. KLAPP-IENA (8) expressed the following opinion on the various methods adopted:

"Without examining the conditions which have such a varied effect on the quantity and quality of feed produced by meadows, we will consider only those which may influence the nutritive value of the crop obtained ..

(a) The period and frequency of the use of meadows is of capital importance in determining the protein content and nutritive value of the vegetation; these are the two essential factors beside which the others are of only secondary importance.

(b) Next, but at a great distance, come the alterations made in the botanical composition. The quantity of protein contained in fodder hay varies in inverse proportion to the quantity of grass but in direct proportion to the abundance of clover.

(c) The influence of manure and fertiliser is indirect and also leads to alterations in the botanical composition.

(d) All the other factors, including measures for the upkeep of the soil, have hardly any influence at all on the protein content of hay, any influence they may have is exercised only indirectly through the alteration of the botanical composition. In this country simple mechanical work executed on the meadows and pastures has generally been found to do more harm than good. If by any chance a second clover sowing is successful (and this occurs only rarely on land which is rich in minerals), the protein content of the hay increases in proportion to the amount of the clover. The hay produced from fresh sowings is often poorer in protein than that obtained from old meadows, especially if quick-growing grasses predominate during the first years after sowing. The nutritive value of the fodder produced can be improved in this case, too, by more frequent use of the meadows.

It must again be stressed that it is the manner of using the meadows which determines the protein content and the influence of every other factor is of less importance, being almost always only indirect."

As a secondary means of increasing the yield of meadows the following methods may be suggested: breaking up of the land for new sowing – early breaking up if there is to be a mixture of clover and grass – rational use of pastures according to the Hohenheim systems (intensive grazing of separate lots) – use of pasturage in proportion to its individual yield at each season (by giving

the cattle complementary fodders if the yield from the pasturage is insufficient) – consecutive use of grazing land by livestock divided into categories according to their yield – harvesting and ensilage of fodders with the least possible loss – a mixed system of mowing and grazing, etc.

(c) *Increase in fodder crops.* — Several methods are suggested for obtaining this result: more extensive use of machinery, irrigation and drainage, the use of manure and fertilisers, etc. An increased use of manure and fertiliser is recommended, not only for the purpose of improving the yield, but also for improving the quality of the fodder and its mineral content, especially its nitrogen content. By a rational selection of fodder plants, by encouraging the cultivation of those giving the best yields or by reducing the fallow periods of arable land (inter-row cultivation and catch crop) it is possible either to increase the quantity of fodder harvested over the same area or to reduce the area cultivated while maintaining production at the same level.

As regards the plants to which preference should be given, it is suggested that those producing the greatest quantity of nutritive substances over an equal area are to be preferred. In order to identify these plants a common denominator of average yields must be found for the various crops so that they may be compared with each other by the calorific values. A calculation of this description has been made by WOERMANN (9), adopting sugar beet as the standard representing the coefficient of yield in nutritive substances per unit of area. His figures are as follows:—

Sugar beet	100
Potato	51.5
Mangold	41.6
Barley	31.5
Rye	26.7
Luzern	21.7
Grassland	22.1

Writing of nutritive substances obtained per unit of area, WITT (10) gives the following proportion: cereals: potatoes: sugar beets = 100 : 200 : 300.

As these calculations are based on average harvests in a particular region, the results cannot of course be taken as holding good everywhere. Nevertheless, they serve as a useful indication and explain why Germany attaches so much importance to root crops (beet and potatoes) in her forage economy. The increasingly widespread use of the sugar beet as a feedingstuff for animals, either whole or as a waste product, is based on these considerations. Sugar beets, sugar beet slices, whether untreated or waste products, fresh or dried, are used for feeding pigs as well as cattle and horses. Tests made by the sugar industry have shown that pigs like this food and profit greatly by it. Satisfactory results have been obtained from replacing the crushed barley ration with dried sugar beet, whole or in slices, dried or ground.

HUSCHKE (11) gives the following explanation of the importance attaching to a change in the basic ration for fattening pigs: "Considering that the food value of barley may be obtained from four times the amount of potatoes, the

following figures illustrate the value, when dealing with home-grown fodders, of replacing potatoes with barley for fattening pigs: 500 square metres of arable land in Germany produces an average of one quintal of barley or oats, 1.65 quintals of maize, 8 quintals of potatoes from which 2 quintals of potato flakes may be obtained, and as much as 12 quintals of sugar beet producing 3 quintals of slices. It is therefore obvious that the principal feeding stuffs can be obtained from the smallest possible surface by using potatoes or sugar beet slices instead of cereals. Root crops, and especially sugar beet slices, are suitable for replacing the concentrates formerly used for fattening livestock, as well as those which were used hitherto for feeding stock used for breeding purposes."

Besides root crops from which it is sought to obtain the majority of the necessary carbohydrates, great importance is attached to many other plants and especially to those known to be rich in protein.

Special attention is paid to legumes containing protein in large quantities. Oil-producing plants are included in this class, although their contribution to food economics is offered indirectly through the residues obtained from the extraction of oil. It is also known that plants consuming large quantities of nitrogens (rye, rape, various kinds of cabbage, etc.), can supply large amounts of protein if they are given sufficient nitrogen. They also offer the possibility of a more varied rotation, and prevent a too frequent return to legumes.

One of the features which distinguishes farming on the self-sufficiency plane is intensive and highly varied cultivation of forage plants and the extension of area sown to these crops. Over and above the large number of plants grown up to the present, others are recommended which are less well-known, less widely cultivated so far or else newly created by plant breeding. Several of these have made only a fleeting appearance, while others have become familiar and no further doubts exist as to their value. The most important plant included in the last mentioned class is the *sweet lupin*, recently bred at the Kaiser Wilhelm Anstalt für Pflanzenzucht, which will certainly become an important source for the production of seeds rich in protein. According to present information, the seed yield is not yet very high and still somewhat uncertain, the husks, moreover, ripen unevenly and the work of selection will consequently have to be continued (12). It may, however, be confidently stated that a plant of capital importance has been found in the sweet lupin, especially when grown in sandy soil, and the green fodder produced from it is much liked. The rapid increase in area sown to the sweet lupin is a proof that it is already considered as important; although the area sown to this plant in Germany was less than 500 hectares in 1933, it had increased to 63,268 hectares by 1938. The following are some interesting figures concerning the value of the substances contained in sweet lupin seeds, as revealed by experiments concerning its digestibility.

Repeated feeding trials with dairy cattle, sheep, horses, pigs and poultry show that sweet lupin seeds are pleasant to the taste, easily digested and that their effects correspond to their theoretical nutritive value. It has been observed that in feeding pigs and poultry it is necessary to supplement the protein content of the lupin seeds with albuminoids of animal origin in order to improve its biological value.

TABLE I. — *Food value of seeds of the yellow sweet lupin (13).*

Results obtained with	Crude Protein digested %	True Protein digested %	Starch equivalent in kg per 100 kg of seed	Roughage %
Ruminants	35.1	33.4	70.9	9.8
Pigs	34.7	30.9	60.0	17.2
Horses	36.5	32.9	58.9	8.1

The experiments in digestibility made with the green fodder produced from the sweet lupin are not yet numerous enough to give average values which are generally applicable; further methodical research must be made at various periods of its growth. All kinds of animals like the green fodder obtained from the sweet lupin and it does not become woody till very old.

Praiseworthy efforts have been made in plant breeding work carried out to discover a variety of *soya* producing large quantities of protein and suited to the northern and central European regions.

Similar research work has been done in Germany in an attempt to adapt *maize* to the climatic conditions of this country and to give this plant a place among those cereals which are cultivated successfully.

Another fodder plant of recognized value, the cultivation of which is steadily increasing, is the *marrow kale* (*Brassica oleracea acephala*). The varieties of this plant in most common use in Central Europe are the English and Danish varieties. An examination of the different varieties has proved that the yield fluctuates considerably and depends essentially on the proportion of leaves and stem, the former containing twice the amount of protein contained in the latter (14). Many experts have also studied the digestibility, food value and effects of this fodder crop and it has been found that the green material contains an average of 2.0 per cent. of digestible crude protein, 1.5 per cent. of net digestible protein and that its starch equivalent is 8.0 kg. In feeding trials it was found that a considerable quantity of protein may be economized if dairy cows are fed on this plant.

Among other plants highly recommended for cultivation during the past few years, mention should be made of the *forage mallow* (*Malva verticillata*), the value of which has been much discussed. Experiments in growing this plant and its use for feeding have given the most widely differing results (15). Its nutritive value is extremely variable and depends on the quantity of leaves harvested and on the season during which growth took place. It is looked upon as a suitable plant for supplying a fairly good fodder, but some experts consider that it does not have a beneficial effect on the milk production. The young plants of the fodder mallow give good results when fed to pigs in the period immediately before fattening; it was observed, however, that the appetite and rate of increase in weight of the animals fell off if the fodder was old. Ensilage experiments (16) have not given good results. It appears that fermentation is

hindered if mallow is mixed with other plants, better results being obtained by adding *Biosil* (0.3 to 0.5 kg. per quintal) to a mixture of equal quantities of maize and mallow (17).

FRÖCHLICH, BÜNGER and their collaborators have examined the nutritive value of crushed mallow seeds and found that they contained from 21 to 22 per cent. of crude protein and from 15 to 17 per cent. of crude fat. Only residue from which the fat has been extracted should be used as a feeding stuff. This crushed residue contains 20.7 per cent. of digestible protein and has proved of use for feeding dairy cows (14).

Besides the plants mentioned above there are many others whose value as green fodder or ensilage has been studied during the past few years. Without giving a complete list mention may be made of the *sunflower*, several varieties of *sorghum*, *buckwheat*, etc.

Another excellent method for increasing the yield of a given area is to *reduce the fallow periods of cultivated land*. This may be done in two ways (1) by reducing the number of fallow fields and the period of grazing over the stubble, (2) by taking catch crops between the harvest and the sowing the next main crops. There are three kinds of *catch crops* (a) those sown among a cereal crop, (b) those sown in stubble, (c) winter catch crops. In view of the large areas sown to clover the first of these three kinds is the most important. Sowings among cereal crops in Germany in 1938 were greater by one third than those in stubble and six times greater than the winter intercalary crops.

Catch crops have made great progress during the past few years. Table II gives an idea of the areas devoted to these crops in Germany.

TABLE II. — *Progress of catch crops in Germany.*

Year	Area sown to catch crops (in 1000 hectares)	Area devoted to	
		Fodder crops	Green manuring
1927	790 2	452 4	437.8
1935	1300 0	975 3	324 7
1938	1399 3	1060 7	338 6

Green manuring crops, which occupied 55 per cent. of the total area in 1927 dropped to 24 per cent. in 1938, while, during the same period, the proportion of ground devoted to fodder crops increased from 45 per cent. to 76 per cent. of the total area sown to catch crops (19). These figures show clearly the growing importance attached to catch crops in the economics of feeding stuffs. An effort is being made through these crops to increase the output of feedingstuffs and consequently the quantity of vegetable protein also; at the same time most of the silage is made from these crops.

The most important forage plants grown as catch according to the kind of soil, climate and season at which the sowings are made, are the following: red clover, several other varieties of clover and grasses, sweet lupin, serradelle, forage

cabbage, mustard, rye, colza, turnip, rape, green maize, fodder mallow etc. The commonest mixtures are grass and red clover, rye and vetch; oats, barley, vetch and peas; beans, peas and vetch.

2. — WASTE AND BY-PRODUCTS USED FOR ANIMAL NUTRITION.

Certain waste and by-products have always played an important part in the feeding of animals. It is not intended, therefore, to give a general account of their uses in the present article; a description will, however, be given of modern methods making it possible, on the one hand, to utilize these products to better purpose and, on the other, to make use of those which have up to the present been neglected. In any case, so much research work has been done in this field that this description must be confined to a few of the outstanding products.

This subject is of particular interest in connection with the self-sufficiency campaign; innovations such as the *Anti-Waste Campaign* (*Kampf dem Verderb*), the collections and utilization of household rubbish, etc., have made extraordinary progress and have led to the accumulation of large quantities of complementary feeding stuffs for animals. While in country homes, and sometimes in those situated in towns, household rubbish is given to pigs, in the large cities, on the contrary, the rubbish is generally lost because it is thrown into the dustbin or carried away to the rivers in the sewage. A special service has therefore been created to collect all rubbish which can be utilized in pig feeding.

Several towns have already built pig fattening stations where the household rubbish is used as feeding stuff; the fact that a station of this description is now being constructed in Vienna with accommodation for 4,400 animals gives an idea of the amount of feedingstuff obtained in this way (21). Similar establishments have been built in many other towns and pigs will in the future be used to consume material which was formerly thrown away.

The use of meat meal and powdered blood collected in the slaughter-houses and at the knacker's is no novelty in itself, but the measures adopted for the collection of these substances inexpensively and without loss and for their subsequent transformation are of recent introduction. There are still large numbers of agricultural and industrial by-products which are little or badly used, and which, if suitably collected, transformed and preserved, could be used mixed with other feedingstuffs richer in nutritive principles for livestock. The economic aspect is here of paramount importance, as most of these methods are not applicable if the cost involved is not proportionate to the nutritive principles obtained. Mention may be made, for instance, of the system invented during the 1914-1918 war for the transformation of straw into a high-grade fodder. The cellulose was separated from the covering substances (lignin, cutin, silicic acid, etc.), by physico-chemical processes and the straw was thus rendered easily digestible. The expense involved, however, made it impracticable under normal conditions (22) and there appears to be no trace, even among the studies inspired by self-sufficiency campaigns, of any further research being made after the work carried out during the Great War.

Much attention is being paid to the collection and preservation of *beet leaves*. While ensilage in pits as practised formerly led to considerable loss, amounting to between 50 per cent. and 60 per cent., and sometimes even more, the modern method, consisting of artificial drying, has reduced loss to 25 per cent. of digestible crude protein and 10 per cent. of its starch equivalent. It should be observed, however, that these losses amount to 20 and 40 per cent. respectively if the leaves have been washed before drying (23). Dried beet leaves are a valuable feeding stuff for livestock on account of their protein content and relatively low proportion of roughage. The degree of digestibility of their protein varies among hens from 56.8 to 72.14 per cent., according to the drying method adopted (24). Pigs, on the contrary, did not take to this feeding stuff and it appears to have a bad effect on the quality of the lard produced.

Mention may also be made of the efforts to extract protein from the juice which is generally lost in the process of preparing potato starch. The waste products from starch factories have been used to prepare several dry products (potato pulp flakes, albumen flakes obtained from potato juice, albumen flakes from potato pulp), all of which have proved valuable, especially in feeding sheep and pigs (25). Their protein content has a high biological value, especially for feeding during the periods of maintenance and growth and MANGOLD considers that these feedingstuffs should be set aside for raising young pigs. The results obtained with poultry were less satisfactory and the protein contained in these foods had to be completed with that obtained from skimmed milk.

Owing to the lack of oilcake obtained from processing oilseeds imported from non-European countries, it became necessary to make a new study of the available kinds of oilcake in order to obtain the best possible yield. This was especially necessary in the case of the *colza oilcake* because colza residue is generally disliked as a feedingstuff for livestock on account of its mustard oil content. Experiments have shown that milk cows take up to 3 kg. of this food when dry without difficulty, but that they refuse to eat it when damp. The effect on milk production corresponds to that of other residues from the extraction of oil from raw material of better quality. When a quantity less than 2 kg. is given, the quality of the butter and milk is in no way lowered even if it smells of mustard oil when damp.

FRÖHLICH and his colleagues have examined the possibility of using colza residue as a food rich in protein for fattening pigs and their research has shown that up to 150 gr. daily per pig may be used to replace a food of animal origin rich in protein, if the residue is poor in mustard oil; 100 gr. may be given if the content of mustard oil is high.

The increased cultivation of *linseed* has led to the discovery of a valuable fodder in the husks of the seeds. BUNGER and FISSMER (14) have studied its digestibility coefficient and have proved that the linseed husk contains 5.3 per cent of digestible protein and a starch equivalent of 30.6 kg.

Dairy by-products have for a long time played an important part in livestock nutrition, especially in the pig-breeding industry. The most important problem at the present time is that of using *whcy*. Every effort has been made

up to the present to discover a method of preserving this product so that it may be used independently of the severe seasonal fluctuations in quantity to which it is subject. A concentrated food, rich in protein, would then be available for storage and transport as required. Attempts have been made to dry the whey and mix it with potato flakes, bran, or other products, so as to increase the protein content of these substances. The difficulties encountered are due to the fact that the whey has to be thickened before mixing and the flakes transported to the place of production, involving considerable expense (26).

Nutrition tests based on dried whey have shown that its content of nutritive principles corresponds as a rule to that of forage barley, while its mineral content, chiefly lime, is higher than that of barley (27). It has been proved that dried whey can be given freely to pigs, young cattle and grown calves, but the somewhat sour taste sets a limit to the quantity which can be added to a ration. In fattening pigs it has been found impossible to replace more than 75 per cent of cereals with dried whey, the maximum quantity which can be used being 825 gr. Poultry were found to refuse dried whey after a few days, probably because of the high proportion of lactose found on examination of the product (45 to 50 per cent.), and because of the lack of specific ferments (lactase) (24).

Besides the whey obtained from the cheese-making industry, that produced in the course of manufacturing textile fibres on a casein basis (28) (29), has also been examined. In this process the whey is obtained by means of sulphuric acid, the surplus being neutralized by the addition of lime. Nutrition tests have shown that the use of neutralized whey has no bad effect on the health of the animals if delivered daily when fresh in wooden containers. RICHTER and EHINGER state that the quantity to be used for food varies between 8 and 10 litres daily per pig, while PIROCCHI and his collaborators estimate 6 kg. for every kilogram of concentrate.

3. — SUBSTITUTES.

These are substances used in an attempt to fill in the shortage of concentrates and especially of foods with a high protein content. One of the next articles in this series will be devoted entirely to the problem of protein supplies under the self-sufficiency system and will deal in detail with the theory and practice of the manufacture and use of these products. Only the general outlines of the problem will be dealt with in this article.

Work in connection with substitutes for foods rich in protein may be divided into two groups: (1) studies with the object of synthesising new materials rich in protein; (2) studies which seek to replace proteins by other nitrogenous substances. A third group might be distinguished including certain work founded on an idea brought forward by MITSCHERLICH and directed towards increasing the protein content of leaves, grasses, tubers or seeds biologically by treatment with nitrogenous fertilisers. But this work may be left on one side as no results of practical importance have been obtained up to the present (30).

The *cultivation of yeasts* by sacrificing carbohydrates and inorganic nitrogenous salts leads to the creation of new foods with a high protein content. These

ideas are not new and were applied during the last war, but they had to be abandoned because the molasses and other substances used at that time became both scarce and expensive. This method has been taken up again during the past ten years as the result of a new discovery which makes it possible to manufacture sugar and alcohol from wood, and especially from the waste products of wood (SCHOLLER, BERGIUS), leading to the creation of "*wood-sugar yeast*". From certain substances unfit for livestock feeding (wood, inorganic nitrogenous substances), it has been possible to obtain an excellent feedingstuff with a high protein content which appears to have a higher nutritive value than brewers' yeast. Several experiments have already proved the efficiency of the new substance.

As the raw material for preparing yeast, Prof. FINK used residues from the distillation of potatoes or from the manufacture of cellulose. The fundamental principle of this work is the selection of a species (*torula*), which makes it possible to increase the quantity of yeast while reducing the quantity of alcohol. From the practical standpoint the use of these materials does not appear to be very economical.

The substitution of protein with non-albuminoid nitrogenous substances is also based on ideas which have been brought forward before now. It has been known for a long time that a part of the necessary albuminoids can be replaced in the digestive organs of ruminants by amino acids, but it is not known how the phenomenon takes place and any explanations given are founded on mere hypotheses. It has been suggested, for instance, that the bacteria prefer to consume amino compounds in order to synthesise their protoplasm, thus supplying the animal with more proteins. Using this theory as a starting point, *salts of ammonia*, *glycocol* and *urea* have been used in turn as substitutes. Although the results obtained have not all been conclusive, WÖHLBIER (31) asserts that in several instances it has been possible to replace the albuminoids in the diet of livestock with these substitutes. Experience has shown that cows fed in this way did not give the same yield as those given the required quantity of protein. This research work has led to the preparation of a large number of foods containing substitutes combined with carbohydrates. The well-known German firm I. G. FARBENINDUSTRIE, for instance, after exhaustive research, has succeeded in preparing mixtures and combinations of urea and nutritive substances. Dried beet slices, bran, linseed oilcake and potato flakes are the chief foods used in this connection being mixed with 15 per cent. of urea in order to obtain a product containing 50 per cent. of crude protein which should therefore have the same value as oilcakes. The products are called: "*amino-slices*", "*amino-brand*", "*amino-oilcake*", (the last mentioned containing 70 per cent. of crude protein) and *amino-flakes*. No details are as yet known concerning the manufacturing process, but according to certain information obtained, it is known that considerable quantities of these products are now ready for consumption. Several nutrition tests have still to be concluded before introducing these substances to ordinary use (30).

Over and above the scientifically established possibility of replacing albuminoid substances with substitutes, numerous processes are recommended which

are often founded only on imaginary data and hypothetical financial profits but the results obtained are not worth mentioning.

In speaking of substitutes, mention may be made again of *wood sugar* which is being tested as a partial substitute for fodder cereals. Numerous tests have shown that the latter can be replaced up to 50 per cent. of the total ration by beet slice and wood sugar; it has also been observed that this ration makes it possible to reduce the proportion of albuminoid substances used. As a matter of fact, KELLNER has already proved that sugars possessed this property.

Recent research carried out in Germany has shown that wood sugar has a higher nutritive value than pure sugar. Similar nutrition tests made in Denmark and Sweden have led to the conclusion that 1.13 kg. of dried wood sugar, i. e. 1.58 kg. of wood sugar, corresponds to one Scandinavian fodder unit.

Although its acid content is neutralized by lime, wood sugar is not suitable for human food, but it can be mixed with other animal feedingstuffs (especially with potato flakes) or used in the dry state. Mixtures with potato flakes are made in the proportion of 1 to 2 and give good results in feeding pigs, especially if the wood sugar can be added in the dry state. At present it can only be purchased on the market in the form of a thick syrup.

There is every likelihood that the use of this food will become more widespread in the future, especially if the cost price can be reduced; this latter is still so high that wood sugar cannot be used as a feedingstuff except in very small quantities.

4. — METHODS OF AVOIDING LOSS OF NUTRITIVE SUBSTANCES BY IMPROVING METHODS OF HARVESTING AND PRESERVING FODDER

As has already been said, it is extremely important under the self-sufficiency system to distribute the available supplies of forage over the winter and summer seasons and also to adjust the differences between harvests. Since imports of feedingstuffs must be avoided, the solution of the problem is found in the preservation of fodder, and this must be done in such a way as to reduce the loss of nutritive principles to a minimum.

Haymaking, which was previously the only form of preservation, led to considerable losses which were subject to wide fluctuations according to the weather. These fluctuations have been estimated as varying between 25 and 50 per cent. of crude protein and between 40 and 55 per cent. of starch equivalent. If the weather was bad the hay harvest lost almost all its nutritive value and to ward off this unfortunate condition recourse was had to the use of hay cocks which varied in shape according to the district where they were used. These structures became so indispensable in several countries that the Government often granted subsidies to enable the farmers to purchase them. The most recent models were often made of wire on which the newly mown fodder was hung out to dry.

It has been found that *ensilage* is the best method of preserving bulky fodders, especially now that towers are used which considerably reduce the danger of loss. This method has been gradually improved during the past few years by processes such as the addition of different acids, of fermentable carbohy-

drates, lactic ferments, by means of the partial wilting of green fodders, by replacing the air which penetrates with carbonic acid in order to prevent the cells from breathing and to reduce the activity of the microflora sterilization, etc.

The large Government subsidies granted for the construction of silos are a proof of the importance attached to ensilage methods. There are many advantages in this method of preserving the harvest; besides the fact that mowing and the grass harvest are now completely independent of the weather and that losses in nutritive substances have been considerably reduced, ensilage makes it possible to use all the green fodders which cannot be satisfactorily made into hay such as colza, turnips, sweet lupin, broad beans, maize, sunflower, marrow kale etc. Preservation in the fresh state supplies a succulent fodder very valuable for stimulating the secretion of milk and with much the same efficacy as mangolds.

Ensilage is of particular importance under a self-sufficiency régime because it is the only way of making complete use of intercalary crops which are generally harvested when hay-making is no longer possible. Besides fodder crops, root crops and especially potatoes for fattening pigs can be preserved in silos. Potatoes which have been washed and then steamed can be kept on the farm for several months if stored in silos, so that a basic food for fattening pigs is available on the spot throughout the year. This method also helps to reduce the amount of labour employed.

Although the building of these towers is fairly expensive, their use is becoming more and more widespread. In Italy, for instance, there were 3,000 silos in 1928 with a total capacity of 485,000 cubic metres, as against 10,331 in 1937 with a total capacity of 1,197,500 cubic metres. The most rapid and astonishing strides in silo capacity have, however, been made in Germany while the total capacity in the former territory of the Reich amounted in 1932 to 650,000 cubic metres, this total was increased tenfold during the period 1933-1938. There was a decline in the construction of new silos in 1938, while the yearly construction of new silos had previously varied between 1.3 million and 1.6 million cubic metres, silo space only increased by 650,000 cubic metres in the period from April 1st, 1938 to April 1st, 1939. This decline was due in part to a shortage of labour which led to difficulties and a drop in the area sown to catch crops (24).

In Germany 80 per cent. of the total silo volume is used for green fodders and 20 per cent. for potatoes.

It is interesting to compare some figures concerning fodder consumption with this rapid extension of the use of silos in Germany: supposing it were desired to feed 75 per cent. of the dairy cows on a normal quantity of silage (20 kg. per cow daily for 200 days of winter feeding), silo space amounting to 30 million cubic metres would be required. On the basis of the results of an average harvest, if the present balance of vegetal output is to remain unaltered, 2 million hectares of catch crops would be required to fill these silos (35). These figures show how much labour and capital would be required to attain self-sufficiency in connection with fodder without having recourse to foreign concentrates with a high protein content.

Besides ensilage, *artificial drying* of fodder crops is now beginning to take hold; the main advantage of this method lies in the preparation of a dry food at a time when it is no longer possible to bring in hay, while at the same time, being less bulky, it is consequently more easily stored and transported. These advantages have induced several countries to encourage the construction of artificial drying plant (36).

The introduction of this method is still too recent for a definite opinion to be given concerning its economic aspects. The cost involved appears to be fairly high, but the product has a high value and can be given to any kind of animal; it is particularly useful in feeding milk cows (37).

Meal obtained from artificially dried fodder must not be considered as a concentrate rich in protein. Its protein content is almost the same as that of fodder cereals, but its starch equivalent is lower. It can therefore only to a certain extent replace cereals in pig fattening based on potatoes.

5. — INDIRECT MEASURES.

Mention will be made in the first place of some methods which indirectly affect the production and use of home-grown fodders, especially political and commercial measures such as the restriction of certain exports, the reduction of railway tariffs, etc.

Suggestions and efforts made in connection with the actual livestock appear to be the most interesting, their aim being to strike a balance between fodder output and consumption. The most radical method consists of fixing the proportion between the number of animals and the available fodder, slaughtering the surplus animals and restricting further breeding. This measure has been applied in a fairly large number of countries, especially in the pig industry and in many cases the head of stock on individual farms has been reduced to the number of animals which can be raised and fattened on the fodder produced domestically. The measures in force in other countries for the compulsory reduction of industrial pig fattening or specialized milk production, while encouraging breeding on the farms, may also be considered as belonging to the same policy.

Interesting changes may result from these measures as is proved by the fact that the German pig population has shifted from one region to another. Ample statistics on this subject were given in the volume *World Production in Meat* (1), and only a few brief remarks will be made on the subject in the present article; 30.3 per cent. of German pigs were concentrated in north-west Germany in 1930. In this fairly restricted area, industrial pig fattening relies mostly on imported feeding stuffs (about 85 per cent. of the barley imported and 2/3 of the maize imported). As a result of the new trends in the supply of animal feeding stuffs, the number of pigs in this area fell in 1935 to 25 per cent. of the total number, in Germany, while during the same period they increased considerably in East Germany, where the animals are fed mainly on local products, especially potatoes.

Another method often adopted is to establish a maximum limit of fattening corresponding to the available quantities of fodder. The fixing of a scale of prices for the different categories of animals makes it possible to observe this regulation while encouraging the production of certain categories to the detriment of others. By means of similar measures, namely, by influencing the price of different animal products, the composition of the stock can also be altered, the number of head of milk cows, for instance, can be increased or reduced, the numbers of young cattle controlled, one breed or another increased (some are more exacting in their food requirements than others), and even the proportions between the various species may be influenced (more sheep, etc.), always in relation to the economics of the fodder problem. Interesting studies have been made during the past few years concerning the existing proportions of animal and fodder production in some given regions; these studies will doubtless be useful as a basis for new self-sufficiency measures.

The regulation of the time of calving, lactation periods, etc., in relation to the fodders available during the various seasons, provides another means of adapting stockbreeding to home production.

Mention may also be made of some efforts, already discussed in the introduction to this article, which are tending to alter the objectives of stockbreeding by adopting the following formula: not maximum yields obtainable only with the aid of foreign concentrates, but good, average yields from strong healthy stock suited to thrive on the bulkier home-grown fodders and available vegetable protein. It is not within the scope of the present article, however, to discuss the arguments for and against this policy.

Conclusion: The influence of the war on the fodder self-sufficiency policy.

The foregoing remarks on technical methods adopted by some countries in an attempt to supply their animal feedingstuffs from home production, give an idea of the considerable effort necessary to overcome natural difficulties, i. e. conditions of soil and climate. It is always difficult to obtain large quantities of green and succulent fodder in a dry climate; similarly, in northern regions the production of foods and particularly of seeds with a high protein content meets with almost insurmountable obstacles. The narrow limits set by nature have been surprisingly enlarged by improvements in technique; the most important task is now that of adapting these limits to economic conditions. Technical progress, the new system of feeding animals by replacing commercial cereals and concentrates by fodders produced on the farm and the new methods of preserving fodder involve considerable outlay which must be added to the normal farming expenses.

The measures under consideration must also be viewed from their economic aspect, although difficulties of this description are often solved by distributing among the mass of taxpayers the cost of a particularly expensive innovation which would lay too heavy a burden on agriculture.

As has been demonstrated, the self-sufficiency movement has made rapid progress and requires immediate solutions. This will have to be borne in mind

when considering suggested measures and also the rapidity with which the measures can achieve results is of importance. It is also important to find out how they can be applied, what their practical results will be, how much fodder and feedingstuffs can be obtained as a result of their application, and in what proportion they are capable of replacing former imports. It is extremely difficult to make an estimate of all this, as statistics are not always available and it is impossible to form an idea of the quantity of fodder supplied by one or other of the main crops and still less by any of the intercalary crops. Even allowing that exact figures may be obtained from statistics concerning the harvests, the amount of nutritive principles contained has also to be found in order to calculate the proportion of former imports which they can replace. The difficulties are increased when it comes to dealing with waste and by-products as these quantities cannot be given sufficiently accurately. Again, the consultation of statistical tables offers no information concerning losses arising in the transformation of some substances into foods, or concerning the preservation of green and succulent forage crops.

Another very important aspect of the problem is the possibility of introducing the various self-sufficiency measures into ordinary practice. It is no easy matter to accustom farmers to new dietary methods when they have become familiar with the old methods and have also acquired wide experience in this field. The new feedingstuffs and mixtures must first of all be given a trial and their regular use demands a special routine. It is therefore difficult to introduce innovations in this field and obstacles have often been encountered in trying to compel farmers to adopt rational feeding methods. Small farmers have always based their stockbreeding on the fodder produced on their farms, after an abundant harvest they therefore use the crop more freely than usual in feeding their stock, especially if it is a product unsuited for sale on the market. The peasant adapts himself to existing conditions and much patience will be required to persuade him that a change is necessary in the use of feedingstuffs.

The adjustment of livestock to home-grown fodders will lead to fluctuations in the number of animals in proportion to the size of the crop. The quality of the crop will also have a greater effect on stockbreeding than it had in the past, when variations in the amount of nutritive principles contained in the crop were balanced by imports of concentrates. It will be impossible, too, to add these concentrates to make up for other shortages or damage due to bad storage or preservation which alter the appearance and smell of the fodder so that it is much less palatable.

A point of special interest is the effect of the present war on the economic aspects of the self-sufficiency policy as applied to fodder, one of the chief arguments in favour of the introduction of the new system as regards feeding stuffs being precisely that in time of war the stock must not be exposed to the risk of a sudden fodder shortage.

Contrary to what happened in 1914-1918, many measures were already in force before the outbreak of war, so that it was possible to maintain the uninterrupted progress of stockbreeding. It is at present impossible to state how far the measures adopted will fill in the gap resulting from the cessation of imports

of foreign feedingstuffs; this is a secret. Account must probably be taken of some factors whose influence will be felt in wartime although they were not noticed under peace conditions when the system under consideration was introduced.

One wonders consequently whether it will be necessary to increase vegetal production for human nutrition beyond the normal peacetime requirements and if so, whether the available fertilisers and manures will be adequate for this increase or whether it will be necessary to increase the area under cultivation. In estimating fodder requirements will it be necessary on account of the large numbers of army horses, to contemplate an intensification in the breeding of these animals? Will the possible shortage of petrol for running machinery lead to a forced increase in numbers of draught animals? Will it therefore be necessary to reduce the feed of produce-yielding stock? Will there be enough labour for raising catch crops, harvesting and storing the output, etc.?

Naturally, each country offers a different answer to these questions; difficulties in world trade will, of course, make it compulsory to extend self-sufficiency measures as regards fodder, even in the non-belligerent countries. It may be concluded that the voluntary or compulsory application of these methods in the near future will be one of the characteristics of stockbreeding in Europe.

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BOVINE TUBERCULOSIS AND BRUCELLOSIS IN JUGOSLAVIA *

Human and bovine tuberculosis is a general problem of considerable importance to mankind and all necessary measures should be taken to control it.

At the present time, as in the past, it is necessary to make parallel studies of the two diseases in such a way that the two studies will be complementary and specialists studying the disease in one form must therefore keep themselves informed of the other aspect of the problem.

The whole question, of course varies in importance from country to country; thus, for example, in Germany the damage caused by bovine tuberculosis and the losses, consequent on the diminution in milk and meat production and the reduced output of work, animal production, etc., is estimated at 350,000,000 RM., a sum equivalent to 5,000,000,000 dinars (MIESSNER and MUSSMAYER T.R.N. 18-1939).

Human and bovine tuberculosis is prevalent to a varying extent in different countries and bovine tuberculosis will present a different aspect according to the importance of animal breeding in the country under consideration. In Yugoslavia, an agricultural country where small proprietors predominate, cattle only serve to supply the ordinary requirements of the farm but as, in the more or less near future, it will be possible to set up an animal breeding industry that caters for the export market, bovine tuberculosis is of special interest.

It is well known that where small herds are the rule, in general they are not attacked or, if so, only to a slight degree and in such cases curative and preventive measures are not difficult and give good results. With the larger herds, which are relatively few in Yugoslavia, even if they are badly attacked, the difficulties of control are not increased and there is a good prospect of complete success for the number of animals they represent disappear, so to speak, in the total for the whole country. The same applies to swine tuberculosis and tuberculosis of farmyard animals.

In Yugoslavia milk by-products are not, in general, extensively used in pig feeding and thus there is little danger of contamination from this source. The breeding of farmyard animals is largely in the hands of small peasants and it may be said that, for the same reason, the dangers are also limited.

With regard to breeding stock imported from abroad and frequently tubercular, the infected animal are eliminated naturally or slaughtered and do not becoming a real menace. Statistical data on tuberculosis of farmyard animals are few and of no great value.

* This article is one of a series dealing with the present position with regard to bovine tuberculosis and contagious abortion in the countries of Europe See: November 1937 (Esthonia), December 1937 (Austria), January 1938 (Lithuania), February 1938 (Switzerland), April 1938 (Poland), May 1938 (Belgium), April 1939 (Hungary), June 1939 (Bulgaria).

On the other hand, human tuberculosis is becoming more widespread in Yugoslavia, this fact in itself is sufficient to justify research on the relationships between the different forms of the disease in different regions of the country and makes the study of the forms of reciprocal infection highly advisable. The old theory of KOCH that there is a difference between human and bovine tuberculosis was abandoned long ago and we know now that there is a danger of reciprocal infection between man and beast and that this constitutes a danger both to man and to the different species of animals. Scientific investigations have shown that infection of human beings, and especially children, by the bovine strains of *Bact. tuberculosis* is increasing, the organisms occur particularly in uncooked milk, a well known source of infection for human beings and farmyard animals.

In the literature of veterinary medicine there are frequent citations of instances where cows have been infected with tuberculosis organisms of human origin, supposing these to be well founded, we are faced with new possibilities for the diffusion of this disease, not only among cattle but also among other animals. Cases of Bang's disease among cattle arising from the same source of infection are also known. As has been already pointed out, the economic structure of Yugoslavia with its preponderance of peasant proprietors is a safeguard against the rapid propagation of a tuberculosis epidemic and against any serious losses from this cause. The few large estates engaged in stock breeding on an extensive scale are in almost the same position as similar establishments in other countries; however, as they do not have much contact with the stock-raising of the peasants, the latter are to a degree protected from tuberculosis and its concomitant losses. In Yugoslavia tuberculosis control is left to private initiative except in a few cases where the state deems it opportune to intervene. Cattle bought with state money or with the aid of subsidies must be healthy and consequently subjected first to the tuberculin test.

Breeding societies are also bound by their statutes to apply this test annually to all their stock, on some big estates the same procedure is adopted but it does not have the desired result for infected animals are not eliminated and thus the value of such "tested" herds is illusory.

As happens in a number of countries, not all the necessary anti-tubercular measures are applied and thus the desired results are not obtained or the scourge may even be encouraged rather than otherwise.

The tables given below show that the tuberculosis data of Yugoslavia are drawn from four sources (1) the data and reports from large herds, relatively these reports are the most numerous; (2) the reports of breeding associations on the testing of breeding stock, cows and young stock with tuberculin; (3) reports from individual peasants and finally, (4) from certain farms situated near a town to which it supplies milk. The administration of towns may order the testing of cows on such farms with tuberculin and may institute a system of control for the purpose of eliminating infected animals which are sent to the abattoir. Animals giving a positive reaction are marked and excluded from the ordinary markets. The statistical data referring to the tuberculin test come from all parts of the country and cover a fairly long period (1930-38) and they thus give a fair idea of the prevalence of bovine tuberculosis in Yugoslavia.

In addition, data are given for the years 1922-1933 from the abattoirs at Zagreb and these show the variation in the number of tubercular cases among the animals sent for slaughter. It will be noted that the abattoirs of Zagreb obtain their cattle from places within a considerable radius and in this region cattle breeding is more advanced than in others. The majority of the animals are produced by crossing Simmental or Pingsgau with the indigenous breeds on the small farms. Further, almost all the animals giving a positive reaction in the tuberculin test are slaughtered here and the results may be considered as very satisfactory. These data were published by Prof. S. DEBELIC in *Veterinarski Arhiv* (1939, pp. 460-477).

During the course of ten years 198,035 cattle were slaughtered and their health was as follows.

Animals, tubercular at the time of slaught-	
ering	0.44 -0.51 per cent.
Cows	0.63 -0.94 „ „
Bulls	0.21 -0.37 „ „
Oxen	0.16 -0.17 „ „
Calves, etc.	0.086-0.12 „ „

From the above, it can be seen that there is only a small proportion of tuberculosis among the slaughter cattle of the neighbourhood of Zagreb and of a great part of the Banovine of Sava, an important district for cattle breeding in Yugoslavia.

Other data give the frequency of bovine tuberculosis in the different-Banovines are given in the other table.

These tables show that in the more important herds which have the largest numbers of animals the incidence of this disease corresponds to 38 per cent., 32 per cent., 18 per cent., 14 per cent., and 10 per cent. of the animals: in one herd with 12 animals the incidence was 100 per cent. but this is doubtless an exceptional case. The herds of the Simmental Breed Society only show a low percentage of infected animals (1, 2 and 3 per cent.) whilst among the peasants' cattle it is lower than 1 per cent. (about 0.4 per cent.).

Near Zagreb there is a herd of 46 animals, nearly all dairy cattle, which has been entirely free of tuberculosis for a number of years as is shown by the results of the tuberculin test, thus it is possible, even in Yugoslavia, to maintain large tuberculosis-free herds. In the Veterinary and Gynaecological Clinic of the Veterinary Medicine Faculty at Zagreb, of which the present writer is dean, 6,824 cattle were tested with tuberculin in the period from 26 October, 1926, to the end of December 1938 43 gave a positive reaction and 7 were doubtful. These animals were mostly from the herds of peasants and a small number from the town of Zagreb itself. The number of infected animals was thus 0.76 per cent. of the total number tested; this result corresponds very well with the figure obtained by Professor DEBELIC at the Zagreb abattoirs. In the tables, however, there is one case given in which 22 cows of a herd of 24 cows and

TABLE I. — *The prevalence of bovine tuberculosis in the different banovines of Jugoslavia.*

Year	Number of herds	Number of Cattle	Animals giving a + ve reaction	Per cent.	Animals coming from large herds	Remarks
<i>Banovine of Drava</i>						
1930	37	396	6	1 4	1	
1931	19	374	42	11 33	3	
1932	115	611	14	2 3	—	
1933	8	128	18	14 0	3	
1934	160	1,263	52	4 12	3	
1935	163	1,159	12	1 03	3	
1936	1,102	5,344	60	1 12	—	
1937	886	648	41	6 32	3	
<i>Banovine of Sava</i>						
1930	2,599	8,621	164	1 08	—	
1931	2,736	10,729	194	1 8	—	
1932	1,931	7,135	50	0 7	—	
1933	3,389	9,564	167	1 7	—	
1934	2,605	9,147	205	2 25	—	
1935	3,674	2,951	154	5 2	—	
1936	3,437	11,565	205	1 74	—	
1937	2,206	6,421	98	1 5	—	
<i>Banovine of Verbas</i>						
1930	91	125	45	32	1	Trappist monastery with 117 cattle of which 45 gave a positive reaction
1931	2	209	32	15 31	2	The above and one other
1932	3	177	31	18 0	2	The above herd and one other,
1933	4	171	9	5 0	2	The above herd and one other,
1934	4	82	0	0 0	2	The above herd and one other.
1935	4	234	90	38 45	4	The above and three other large herds
1936	15	368	55	14 9	—	
1937	8	99	9	8 7	—	School of Agriculture and Quarantine Sheds.
<i>Banovine of Drina</i>						
1930	192	796	36	4 5	—	
1931	99	386	—	0 0	—	
1932	57	124	2	1 6	—	
1933	73	121	7	5 7	—	
1934	30	86	1	1 16	—	
1935	1	7	0	0 0	—	
1936	—	—	—	—	—	
1937	—	—	—	—	—	

TABLE I (cont.) — *The prevalence of bovine tuberculosis in the different banovines of Yugoslavia.*

Year	Number of herds	Number of cattle	Animals giving a + ve reaction	Per cent	Animals coming from large herds	Remarks
<i>Banovine of Littoral</i>						
1930	—	—	—	—	—	
1931	1	12	12	100 0	—	
1932	2	94	2	2 1	—	
1933	—	—	—	—	—	
1934	1	25	—	—	—	
1935	—	—	—	—	—	
1936	1	59	6	12 00	—	
1937	—	—	—	—	—	
<i>Banovine of the Danube</i>						
1930	1,200	2,998	75	2 5	—	
1931	1,532	3,760	154	4 1	—	
1932	1,614	3,536	80	1 26	—	
1933	1,145	3 131	108	3 44	—	
1934	1,218	3,723	100	2 9	—	
1935	593	2,028	105	5 17	—	
1936	1,694	4,601	124	2 7	—	
1937	2,674	7,153	287	4 0	—	
<i>Banovine of Morava</i>						
1930	130	282	1	0 305	—	
1930	130	282	1	0 305	—	
1931	867	1,104	16	1 4	—	
1932	439	335	14	3 9	—	
1933	316	392	7	1 8	—	
1934	509	734	13	1 7	—	In one herd there were 13 tubercular animals out of 50
1935	244	273	14	—	—	In another 14 out of 27
1936	299	651	42	6 46	—	In another 28 out of 120
1937	252	252	5	1 98	—	
<i>Banovine of Vardas</i>						
1930	1	1	—	—	—	
1931	3	8	2	25 0	—	
1932	2	9	2	22 0	—	
1933	320	938	2	0 1	—	
1934	144	501	2	0 4	—	
1935	24	246	1	0 4	—	
1936	4	88	0	0 0	—	
1937	1	2	0	0 0	—	
<i>Banovine of Zeta</i>						
1930	1	11	—	—	—	
1932	2	13	—	—	—	
<i>Belgrad (Town)</i>						
1929	1	24	22	90 0	—	Bought after the war for the herds of large and owners

2 heifers gave a positive reaction; these cows were purchased after the war as good dairy stock and came from large herds, but as a result of the test all the cows giving a positive reaction were eliminated.

Subcutaneous injection, as officially prescribed, is the usual method of testing but at the university clinic other methods are also in use such as intradermal injection and ophthalmic inoculation.

As has already been stated, tuberculosis control has been left to private initiative up till now though according to the law on epizootics, (June 26, 1928, para 91) the Minister of Agriculture may order the slaughter of tubercular cattle. The consumption of milk from cattle having tubercular mastitis is prohibited and, according to para. 92 of the same law, the State may grant a subsidy to cattle breeders who undertake to eliminate all tubercular animals from their herds.

The eradication of tuberculosis in Yugoslavia is not impossible nor would it, at the present time, be a very difficult problem, for the small number of tubercular animals could be fattened and slaughtered without much loss to their owners. Proposals of this sort are now under consideration and it is hoped that within a short time it will be possible to free the country of this disease without any very heavy expense or serious damage.

* * *

As regards contagious abortion there are no statistics available to judge the present prevalence of this disease in Yugoslavia and for this reason only a few remarks can be made.

Contagious abortion (Bang's disease) has been known in Yugoslavia since 1924 in which year it was diagnosed in a large herd, the disease had been introduced with some cows bought in another region. After this the disease was found in other large herds so that it may be said that it is limited today to the larger herds of which there are few. On peasant farms it is of rare occurrence. In these circumstances, the eradication of contagious abortion does not present any difficulty.

Control of the disease is based on hygienic measures, calving in the stall, treatment of the infected uterus, disinfection of the sheds and isolation of infected animals, the results obtained in this way have been satisfactory.

Immunisation with living vaccines is neither desirable nor is it practised any more for this method incurs the danger of maintaining the disease permanently.

Up to the present experiments with chemico-therapical methods of treatment have given negative results for all the various preparations used.

M. RAJČEVIĆ

*Dean of the Faculty of Veterinary Medicine
of the University of Belgrad,*

MISCELLANEOUS INFORMATION

Wheat Breeding in Uruguay.

Wheat cultivation in Uruguay is subject to many hazards arising from the climate and the soil. Between 1883 and 1936 the mean annual temperature at Montevideo varied from 14° C (1886) to 17.2° C (1900, 1926, 1932) whilst rainfall varied from 2399.7 mm. (1914) and 4403 mm. (1892). Summarising the daily observations of temperature and rainfall between 1915 and 1926 at the Estanzuela Plant Breeding Station, A. BOERGER said that here abnormality was the rule. The winter rains are very abundant and sometimes completely stop cultivation for long periods. The clayey and impermeable soils dry out slowly before they can be worked. The impoverishment of the soil organic matter by monoculture also tends to aggravate the situation. It also happens frequently that, instead of finishing the sowing of winter wheat in June or July, the normal time, it is necessary to wait until the end of August in order to begin.

These conditions of soil and climate, favourable as they may be for cattle breeding, explain why wheat cultivation develops so slowly. The wheat crop is however of importance economically; the production being absorbed internally it is independent of foreign markets.

The Plant Breeding Station at La Estanzuela has undertaken, as an essential problem, the production of a wheat that gives a regular yield under any weather conditions rather than an exceptionally high yield, that is to say, varieties that may be planted any time between May and August without seriously affecting the yield. A series of varieties have been produced "Centenario", "Porvenir", "Litoral", "Litoral", "Litoral", "Litoral precoz", "Pelón plateado". The last two in particular are suitable for late sowing whilst Litoral is used for the earliest sowings. Litoral is almost entirely immune from *Ustilago tritici*. In 1929, *Puccinia glumarum* made a disastrous appearance and present efforts are directed towards the production of varieties immune from rust.

Compared with the standard Argentine varieties, the majority of Uruguayan wheats are soft wheats, only "Litoral" and "Pelón plateado" can be included among the semi-hard wheats.

The best varieties of Argentinian wheat have been compared with the varieties from Estanzuela, the sowings taking place in echelon.

The latter, and particularly "Litoral precoz" and "Pelón plateado" showed up very well, the last giving the best results for every sowing time.

A BOERGER, to whom we are indebted for this information, cites, as a proof of the soundness of the methods followed at Estanzuela, the harvest of 1936-37. In that year the rain prevented cultivation till the middle of July and the crop seemed hopelessly lost. The Government then changed, at its own expense, all the seed corn of varieties that required to be planted before a given date for other seed of the less exacting varieties bred specially for late sowing. Although sowing was not finished till the end of August the crop was satisfactory and it was even possible to export 4,000 tons.

In 1919-1920, the year that the Estanzuela varieties began to expand, the area under wheat was 275,000 hectares; about 550,000 hectares are now devoted to this crop. From 1911 to 1920, the average yield per hectare was 571 kg and from

1921 to 1930, 760 kg. The yields over the period 1931-1940 may be expected to show a similar increase in spite of the presence of *Puccinia glumarum*.

It is reckoned that the benefit to Uruguayan agriculture resulting from the use of the new Estanzuela varieties is about 5,000,000 pesos per year A H

The Development of Potato production in Germany.

Interesting particulars concerning the production and utilisation of potatoes in Germany are given in the journal *Der Vierjahresplan* (Berlin November 20, 1939). The information covers the last few years and indicates the part that this crop must play in the future

The control of the supply of fodder that has been in force since 1933 has given the potato an outstanding position in animal nutrition. As a result of this regulation a certain change may be noted in the utilisation of the harvest as shown by the following figures:

Percentage used for human nutrition	25
" " " alcohol manufacture	4.5
" " " starch manufacture	3.5
" " " for drying	3.5
" " " seed	12.5
" " " animal feeding	43.0
Various losses	8.0

Potatoes used for animal feeding may be used either fresh or ensilaged and the majority of the dried products (flakes) are similarly employed for animal feeding. In particular, the system of agricultural production in the last few years has encouraged the use of potatoes for feeding stuff and especially so in pig feeding. The construction of silos and pits for the storage of potatoes as well as the setting up of establishments for the manufacture of potato flakes have received state encouragement, ensilage and the production of potato flakes is of very great importance for, in this way, it is possible to use potatoes for animal feeding during the whole year. The use of flakes has increased very greatly and the present production is four times that of 1934-35.

The increasing use of potatoes in pig fattening, which is bound to decrease the use of cereals, is causing an increase in the labour required for more work is involved in handling 17.6 quintals of potatoes than in handling 6 quintals of cereals.

The following figures give an idea of the increase in the cultivation of potatoes that has taken place in the former territory of the Reich

1933	2718	152.6
1934	2750	160.9
1935	2770	149.1
1936	2803	165.9
1937	2888	191.5
1938	2893	175.9
1939	2824	184.0

These figures show an increase in the area devoted to potatoes up to 1936, in subsequent years there has been a shortage of labour but it is hoped that a more extensive use of machinery will counterbalance this deficiency.

More important than the actual increase in area is the increasing yields per hectare. In the years 1910-1913 yields were only 136.1 quintals per hectare.

According to the latest estimates, 56,300,000 metric tons of potatoes were available in the increased area of the Reich in 1939. In spite of difficulties, it was possible to store this enormous quantity and it is hoped that it will provide for 30 per cent. of the food requirements of the increased territory, being used for human consumption, both directly and indirectly after transformation by animal production.

I. M.

A Jute Substitute.

There is a notice in *Agronomie Coloniale* (No. 258, June 1939) and in the *Bulletin Economique de l'Indochine* (No. 5, 1939) on a plant of the order Malvaceae, "le Polompom" (*Thespesia lampas*), which grows wild in the north of the Province Vientiane near the frontier of Cambodia and in particular in the valleys of the Mékong and its confluent. This bush yields a fibre of good quality that is, in many ways, reminiscent of jute in its staple length and general chemical and physical properties. Its lower hygroscopicity, however makes it less liable to rotting and, by delignification, a white fibre is obtained that is very suitable for making fine string. This fibre can replace jute of average quality to advantage in the principal uses of the latter, namely, bag-making and cordage.

The "polompom" thrives in alluvial soils and fertile sandy loams. By broadcast sowing or planting in pockets a good workable plantation may be obtained in 18 months. The annual yield of dry fibre is about 1 ton per hectare and two crops per year may be taken from well established plantings on fertile soil. Retting of the green bark must be carried out immediately after cutting. The bark when skinned off and dried may be kept a long while and the fibre retted at any time. Retting gives a yield of dry fibre that represents 3 per cent by weight of the green twigs when the latter are stripped dry and 5 per cent. of the green bark.

J. I.

The Effect of Weather on the Fattening of Pigs.

The Institute of Animal Physiology at Budapest has undertaken an investigation of the possibility of the weather affecting the success of pig fattening. With this end in view, 7000 pigs of the mangalica breed varying in live weight from 10-200 kg have been studied over a period of four years and the results have been published recently in the journal *Mezőgazdasági Kutatások* (Budapest, 1939, Nos 8-10).

With identical feeding for all the animals it was found that pigs of the same weight utilised the same starch equivalent of their ration differently according to the month of the year. The best return was obtained during the summer months and the poorest during the winter. Young animals were most sensitive to temperature as was shown by the use of the starch equivalent of their food. For heavy pigs it was found that May was the best month for fattening whilst in August and September animals exceeding 110 kgs live weight had a very reduced appetite when the temperature reached 30° C. The influence of other factors, such as the intensity and duration of sunlight, the length of the day, the rate of evaporation and the humidity of the air, was found to be smaller.

I. M.

Porous Glass, a New Building Material.

In the search among various raw materials for light insulating materials that have a high resistance to weathering, porous glass has been investigated. By mixing the vitrifiable materials with certain others in fine powder form, the glass factory of Saint Global, France, has obtained a "multicellular glass" which owes its peculiar properties to the liberation of gas by the above mentioned powders during the fusion. On solidifying the bubbles formed remain in the solid material giving it a porous texture.

The light porous material obtained in this way can be cut, sawn, drilled, nailed and even polished; further, it does not absorb moisture and is therefore a good insulator.

These useful properties have suggested the idea of grinding mixtures of glass powder with materials that liberate gas and other plastic materials in order to obtain by fusion a material peculiarly suited for rural building.

H. J. H.

A scheme for a joint investigation on the preservation of foodstuffs by refrigeration and an atmosphere of carbon dioxide.

At the temperature of incubation carbon dioxide favours the development of certain anaerobic and facultative anaerobic bacteria and in some instances it is used in the laboratory in the cultivation of such organisms; however, in cold stores even a low concentration it delays or prevents the development of the organisms that are responsible for the decomposition of perishable materials.

MALLAM, at the Michigan Agricultural Experiment Station has observed a marked effect on the microorganisms attacking meat and STEWART, of the Iowa Agricultural Experiment Station has observed that eggs stored in an atmosphere of carbon dioxide retain their freshness better than those stored at the same temperature under the usual conditions.

BROOKS, of the Bureau of Plant Industry, U. S. Department of Agriculture and ALTEN at the California Agricultural Experiment Station, as well as many other workers, principally in England, have shown that fruit can be stored and transported more successfully in an atmosphere of carbon dioxide than is the case under more usual conditions.

Cold storage in an atmosphere of carbon dioxide is used commercially on a considerable scale in England for many different products, including fish, fruit, vegetables, eggs, dairy products and meat. In 1937 Australia and New Zealand exported 75,000,000 lb. of chilled meat in an atmosphere of carbon dioxide; after the journey of 28 days the meat arrived in a better condition as regards colour and appearance than that preserved by merely chilling.

This improvement in cold storage technique for perishable goods is not yet in use in the United States. The reason was, in the first place, the lack of automatic apparatus for controlling the carbon dioxide concentration for there is a definite optimum for each product. Now such an apparatus is available and it only remains to know the specific requirements of each industry. For handling the gas there are also apparatus allowing the transformation of dry ice into gas which is more economical than the use of gas cylinders.

Storage in gas offers several advantages, it allows the maintenance of a higher humidity in the cold store and thus reduces the loss in weight. It also avoids the losses due to micro-organisms on the surface of meat and, as the storage temperature is higher, running costs are less, finally the ultimate condition of the products is superior and more pleasing to the consumer.

The technique must however be further studied and tested carefully in order to be able to use it commercially without risk. To avoid loss of time and money and the set-backs that would be inevitable were the investigations carried out separately by the various industries interested, the American Refrigeration Industry has drawn up a program for joint research on the application of carbon dioxide, the "Carbon dioxide Research Project" and has nominated the nucleus of a general committee in charge of its execution. This committee is under the chairmanship of Dr. F. A. HARVEY and includes Dr. F. PENNINGTON, Dr. S. C. PRESCOTT, Mr Gardner POOL, and Mr C. A. HORNE who represent the scientific laboratories of the refrigeration industries.

The general committee will allot the work and will fix the expenditure for each product, for each product there will be advisory committees set up and these will meet regularly and will report to the principal committee.

The necessary funds will be raised by voluntary subscriptions from the industries interested in the research and the protection of new discoveries and or new processes arising from the investigations will allow the different branches of the food industry taking part in the scheme to profit by them in their own undertakings.

The laboratories of the Bureau of Plant Industry, U. S. Department of Agriculture and those of the agricultural experiment stations of the States of Michigan, Indiana and Minnesota have already set up refrigeration plant with automatic carbon dioxide control and started the investigations. Other stations are following suit in Wisconsin, Iowa, Florida, Texas, California, Oregon and Washington and the Massachusetts Institute of Technology is also taking part in the work.

A H

The Possibility of an Industrial Use for Cherry Stones and Walnut Shells.

Dry distillation tests carried out in Italy by Gaetano LEGGIERI and reported in the November number of *Organizzazione scientifica del lavoro* show that it is possible to obtain an inflammable gas, methyl alcohol and charcoal, which can be used as activated charcoal.

Cherry stones, distilled at 420° C, yielded 15 per cent of gas, 6 per cent of tar 42 per cent of crude pyroligneous acid and 30 per cent of charcoal.

Walnut shells distilled at 300° C yielded 14 per cent of gas, 6 per cent of tar 44 per cent of crude pyroligneous acid and 31 per cent of charcoal.

G R

Autarchic Nutrition in Italy.

The programme which the Italian farmer is expected to fulfil was published on January 21, 1940 by the Italian Minister of Agriculture, TASSINARI, on the occasion of the distribution of prizes to the winners of the national competition, "The Wheat Battle". The details are as follows:

(a) 85,000,000 quintals of wheat at once and 90,000,000 quintals immediately afterward,

(b) 35,000,000 quintals of maize,

(c) an increase of 1,000,000 quintals in meat production and 700,000 quintals in oil production.

Thus, the three important branches of agriculture, wheat cultivation, cattle breeding and oil production are all to increase their output.

Since the institution of the "Wheat Battle" in 1925, government action has made itself felt by several measures that have aimed at improving the methods of production at the disposal of the farmers and at maintaining the price levels. To reinforce the inadequate effects of customs duties on wheat imports and to avoid speculation, the Government has made the accumulation of stocks compulsory.

As regards maize, there is little more to be done since the 1937 harvest already reached 34,000,000 quintals.

The 700,000 quintals of oil can be obtained partly by better cultivation of the existing olive plantations, the regeneration of abandoned plantations and the grafting of wild olive trees of which there are about 12,000,000, half being in Sardinia.

The increase of meat production will doubtless be more difficult for it implies a big increase in the forage supplies of the country and the exploitation of new land. It is hoped that the goal will be reached by the system of internal colonisation, by changing the old southern system of exploitation known as the "*latifondo*", the irrigation of huge areas and by the general improvement of badly cultivated or abandoned land (*bonificazione integrale*). Important steps for the realisation of this program have been already taken and the sum available for credits for land improvement, for irrigation and for colonisation of the southern *latifondo* is 5,000,000,000 lire.

G R

BOOK NOTICES

Federation internationale de la presse agricole. Repertoire international de la presse agricole Rome, 1939, 419 pp 60 Lire

[The International Agricultural Press Federation has certainly accomplished a great task in drawing up a universal list of all the agricultural periodicals of all countries for such a work of an international character was entirely lacking hitherto. As everyone knows, there are general lists of periodicals in various countries—but by no means in all—and these lists have often lacunae and present difficulties in the documentation of the specialized press on various subjects. To prepare this new list it was necessary to conduct a wide enquiry and it would seem that it was impossible in the course of this first attempt to obtain an absolutely complete list or a uniformly classified one, however, for some countries the data are very complete and include besides the address, the date of foundation, the edition, the format, the periodicity, the printing, the price and other similar details whilst for others the information is limited to the title and the place of publication. However, the classification of periodicals in a given country cannot always be drafted on a uniform plan, in some cases classification by subject matter is followed whilst in others a list in alphabetical order of the titles or of the places of publication have to suffice.]

The use of the list is facilitated by a carefully drawn up index which refers to the numbers given to the periodical in the main list. In all, 4000 periodicals are included, yet another proof of the importance of the agricultural press. At the same time one must not lose sight of the fact that agricultural literature is not limited to the specialized professional press but also spread over a number of other reviews and periodicals that may be of a scientific, economic, legal, statistical or any other character. It is of course impossible to include such material in this work although it plays a quite important part beside the agricultural press proper. The list of periodicals is preceded by a collection of the statutes of the national agricultural press associations.

This work is due to the initiative of M. MORALES Y FRAILE, Agricultural Engineer, and all the necessary help and encouragement was given him by D. Franco ANGELINI, Secretary General of the International Agricultural Press Federation and the International Federation of Agricultural Experts. S. v. F.

SLEBINGER, Janko and Janez MARENTIĆ *Bibliografija slovenske, kmetijske literature v letih 1919-1938* Ljubljana, (Kmetijska sbornica), 1939, 207 p (Izdanja Kmetijskega zbora Dravske banovine, n° 2) [A bibliography of Slovenic agricultural literature for the years 1919-1938]

[The ever growing interest in agricultural bibliography is well shown by the fact that the publications of a small ethnic group with a language that is but little known, should be of sufficient importance to be subjected to a detailed bibliographical analysis. It is surprising, however, that Slovenic agricultural literature should be represented during this relatively short period of years by a total of 300 books and booklets, 10,000 articles in periodicals and 40 newspapers and journals. Even when it is considered that a great part of this literature is probably of local interest only, this bibliography—a successful work in itself—seems to be an enterprise worthy of imitation for international bibliographies cannot by themselves cover strictly local problems.]

The bibliography is divided into four main sections according to subject matter, as follows. (1) agricultural economics (including agricultural education, rural economy, agrarian policy and reform, social problems in the village and domestic economy), (2) cultivation of plants (including cereals, industrial plants, horticulture, fruit growing, etc.), (3) animal production (including cattle breeding, dairying, apiculture, sericulture, etc.), (4) forestry, game and fish.

Each section includes a number of detailed subdivisions in which titles are given in no preconceived order, at the end of the bibliography, there is a list of the principal Slovenic authors on agriculture with biographical references and an alphabetic key to the bibliography. In spite of certain imperfections in the manner of presenting the material, this Slovenic bibliography is a useful initiative and should encourage other countries who hitherto have not published an agricultural bibliography, to follow this good example. S. v. F. and M. C.

Prof. UGO PAPI, *Segretario generale dell'Istituto, Direttore responsabile.*

MONTHLY BULLETIN

OF

AGRICULTURAL SCIENCE AND PRACTICE

A SURVEY OF FILMS ON AGRICULTURAL SUBJECTS

3. — NORWAY

Information communicated by the Royal Norwegian Department of Agriculture. Previous articles in this series: Italy (January, 1940) and Finland (March, 1940).

The value of educational films in the public and higher grade schools and in the universities has long been recognized in Norway, and many vocational schools own complete cinematographic apparatus. The organization of the rural educational cinema is, however, of fairly recent date and there are very few films in Norway on purely agricultural subjects. It was not until 1937 that the Ministry of Agriculture appointed a Committee to select films suitable for use in vocational agricultural instruction and to prepare a catalogue of these films. This list (see below) which so far contains the names of only 45 films, is being added to and is kept up-to-date by the Committee; any additions made to the catalogue must first be submitted by the Committee to the Ministry of Agriculture for approval. Some of these films were produced abroad. Through the "Kommunenenes Filmcentral", the Ministry is in touch with the principal producers of documentary films in other countries; obviously, however, foreign agricultural films are not in all cases be suitable and there is a growing tendency to build up a collection of home-produced films of this kind.

Films are hired from private firms as the Ministry of Agriculture has not yet formed its own collection. The most important of these concerns is the Nerlien, which has supplied the information given below concerning prices and conditions; mention should also be made, however, of the following firms: Messrs. Rich Andvord, Karl Johansgt., and Messrs. Agfa Foto A. S., Fred. Olsensgt I; all three firms have their headquarters in Oslo, but there may perhaps be other firms elsewhere.

TERMS OF HIRE. PURCHASE.

The films listed in the catalogue kept by the Ministry of Agriculture as given below may be hired from JI. Nerlien, Nedre Slottst. 12, Oslo.

(1) Only six films may be hired at one time.

(2) The lessee is responsible for keeping the films in good condition and must return them immediately after use.

(3) Films are sent only after a sum equivalent to their price has been deposited with the firm, the refund being made immediately after the return of the film, less cost of hire. No deposit is required from public schools or persons who already have an account with the firm.

(4) The price of hire depends on the length of time the film is kept, whether it is in use or not.

(5) Films in the 16 mm. size are from 90 to 120 metres in length and take about 15 minutes to show. Terms are 3.50 kroner per film for the first day, and 1.50 kroner for each subsequent day. The price for one month is 30 kroner, rising by 7 kroner for every week thereafter. When films are hired by the month payment must be made in advance. Carriage is paid by the lessee.

(6) Each film is accompanied by a card bearing the terms of hire, the date of despatch and the date for return.

(7) A charge of 165 kroner is made for any film destroyed, less one per cent. for every film previously hired.

(8) In case of minor damage a charge of 1.50 kroner per metre is made with a minimum of 3 kroner.

(9) The showing of "Kodascope" 16 mm. films in public is prohibited.

The price of Nerlien films varies from 120 to 165 kroner according to production costs.

COST OF CONVERTING FILMS FROM ONE SIZE TO ANOTHER.

(1) *Conversion from the 16 mm. size.* For less than 100 metres: 0.85 kr. per metre. For more than 100 metres 0.80 kr. per metre.

(2) *Conversion to 16 mm. from 35 mm. size.* (1 metre of the 16 mm. size is equivalent to 2.5 of a 35 mm. film).

Conversion from the negative of a 35 mm. film:

1 kr. per metre for 16 mm. films less than 60 metres in length.

0.85 kr. per metre for 16 mm. films over 60 metres in length.

Conversion from the positive of 35 mm. film:

1.15 kr. per metre for 16 mm. films less than 60 metres in length.

1 kr. per metre for 16 mm. films over 60 metres in length.

A reduction of 15 per cent. is made on these prices for all orders placed through the Agriculture Bureau of the Ministry of Agriculture.

Attached to each film is a booklet giving complete information on the subject illustrated, for use in the preparation of a lecture to be given with the showing of the film. Each booklet costs 0.50 kr.

LIST OF FILMS.

The following is the list, divided into 15 categories, of the films compiled, by the Committee. Some of the films are not agricultural in the strict sense of the term, but they have been left on the list because of their educational interest.

The letter E placed before the number of the film indicates that the titles are in English; the letter N indicates that they are in Norwegian.

Group I. — *Preparation of the land*

Group II. — *Plant cultivation.*

N. 9104 — From the seed to the grain: new crops, ploughing, manuring, sowing, harrowing, rolling, germination and ripening of wheat, harvesting, various methods of harvesting, threshing and storing of wheat.

(This film gives a general view of the subject without much detail).

Group III. — *Farming technique.*

N. 9039 — Internal combustion engine: the four strokes of a single cylinder engine; comparison with the firing of a cannon. Different movements of an engine. Ignition system of a single cylinder engines. Water-cooling, air-cooling.

(A very good film).

Group IV. — *Animal husbandry.*

Group V. — *Horticulture.*

Group VI. — *Forestry.*

N 1223 — Floating logs down the river Topdal. (Film giving a general idea of lumber floating).

Group VII. — *Domestic economy.*

Group VIII. — *Biology.*

N 9069 — *Birds native to the plains:* starling, wagtail, titmouse, blue tit, finch, dipper, swallow, house swallow, martin (swift), wren, woodpecker, cuckoo, owl, great owl, sparrow-hawk, goshawk, blackcock, grouse, woodcock, lapwing, curlew.

(A good film from the zoological standpoint).

N 9070-a — *Mountain birds:* raven, field fare, blackbird, nuthatch, wheatear, grebe, tit, woodlark, ptarmigan, partidge, crane.

(Good film from the zoological standpoint).

N 9070-b - *Mountain birds*: snipe, double snipe, phalarope, green sandpiper, golden plover, teal, duck (mallard), pochard.

(A good film from the zoological standpoint).

N 9071 - *Mountain birds of prey*: Owl, snow owl, dwarf hawk, rough-legged buzzard, royal eagle.

(An excellent zoological film).

N 9072 - *Sea birds*: Wild goose, eider-duck, guillemot, diver, crested cormorant, oyster catcher, fishing eagle, sea-mew, sea-gull, great black-headed gull, laughing gull.

N. 9073 - *Norwegian mammals*: hedgehog, badger, hare, beaver, roebuck, reindeer, moose, blue fox.

(Some of the reproduction is good).

N 9074 - *Growth of soles' eggs*: All stages of the development of soles' eggs reproduced in direct moving pictures, microcinematographic pictures and projections. The film shows the female sole carrying the eggs, the male sole, artificial fertilization of the eggs and the various stages of growth, first movements of the embryo in the egg, breaking of the shell and finally the tiny fish entering the water.

(A good biological film).

N 9096 - *Green plants*: An illustration of how all living creatures feed on plants. Growth of food reserves contained in green plants. Sunlight, chlorophyll, water and air all collaborate to produce the sugar and starch accumulated in roots, stems, leaves and fruit.

(A good film on plant physiology).

N 9102 - *From flower to fruit*: Illustrates how every part of the plant contributes to seed production. Roses, lilies and potato flowers ripen, the anthers produce pollen, insects carry pollen from plant to plant. Growth of the embryo. After complete fertilization the fruit grows. Pictures of the different phases. Combination of photographs and drawings.

(A good film on plant physiology).

N 9036 - *Digestion*: Digestive duct, action of saliva on food, swallowing, the part played by the stomach, the intestines.

(Microphotographs, X rays. Good anatomical and physiological film).

N 9035 - *Circulation of the blood*: Drawings and photographs illustrating the circulation of the blood in human beings. Comparison of the human heart with that of the frog. Pulmonary circulation.

(An excellent anatomical film).

N 9038 - *The blood*: shows how the blood corpuscles are separated from the plasma, proteins and salts. Colouring of cells. How the leucocytes reach the body tissue. Coagulation of the blood.

(An excellent anatomical film).

N 9040 - *Breathing*: illustrating the importance of good lungs. Explanation of the action of the diaphragm. The respiratory system. Structure of the lungs and their work.

(An excellent anatomical film).

N 9041 - *Life and structure of cells*: Division and growth of mono-cellular organisms such as the amoebae and other protozoa. Distribution and growth of primitive metazoa, such as the hydras and planarides and of cells in living tissue.

(A very interesting film).

N 9044 - *Regulation of the circulatory system*: showing the circulation of the blood through the veins. Measurement of blood pressure. Description of veins and their work. Nature's methods for regulating the circulation.

(An excellent anatomical film).

N 9051 - *Growth of the human teeth*: radiography. The various parts of the teeth illustrated by drawings and photographs. Caries. Preventive care. (The first part deals with the growth of the first and second teeth).

E 1224 - *The bed of the Atlantic*: Slow motion pictures.

(A very interesting and instructive film from the zoological point of view).

E 1119 - *Roebuck, moose, fallow deer*.

E 1120 - *Hippopotamus, Elephant, Cobra*.

(Recreational film).

E 1121 - *Cats, beavers and bears*.

(Instructive and recreational film).

Group IX. — *Chemistry, physics and meteorology*.

N 9019 - *Circulation of water*: Graphs illustrating the continuous circulation of water from the land to the atmosphere and back again to the land. Examples of evaporation, condensation, precipitation, accumulation and drainage of water.

(Gives a very complete general idea of the subject. Emphasises the action of the winds on sea and land, by night and day).

N 9050 - *Steam power*: Early steam engines and improvements leading to the invention of the steamboat. Construction of a simple steam engine, steam boilers and locomotives.

(Combination of drawings and photographs. Diagram of the working of a steam engine).

N 9005 - *Atmospheric pressure*: Illustration of atmospheric pressure. Demonstration of the experiment with the Magdeburg hemispheres. Variation of atmospheric pressure between valleys and mountains, land and sea.

(An excellent film on physics).

N 9030 - *Simple machines*: The lever, the inclined plane. Explanation of the various principles of mechanics. Advantages of simple machines, mechanical moments, work, degrees of efficiency and saving of energy. Elaboration of complicated machines from simple machines.

(An excellent film on physics).

N 9053 - *Solar energy*: Principle of a machine run on solar power. Illustration of the power of falling water, light and wind. Demonstration of how solar energy stimulates the growth of plants and how it accumulates for later use in the form of wood and coal.

(A good educational film).

E 9084 - *Optical instruments*: Reflection and refraction of light, use of these phenomena in optical instruments. The mirror, the eye, spectacles, the camera, the microscope, field glasses, the telescope.

(A good film on physics).

E 9085 - *Magnetic effects of electricity*: Magnetism and magnetic induction; application of electro-magnet, the electric clock, the ammeter, the voltmeter, and electric motors. Theory of permanent magnetism and explanation of terrestrial magnetism.

(A good general view of the subject).

E 9100 - *Induction currents*: Principle of magnetic induction in light and power generators. Transformation of alternating current into continuous current. Commutators, transformers and the telephone.

(An excellent film on physics).

E 3011 - *Operation of the telephone*.

(A rather well-made film on physics).

E 3023 - *The human voice*: Mechanism of hearing.

(A good anatomical film supported by drawings).

Group X. — *Geology and soil science*.

N 9022 - *Limestone and marble*: Showing the relationship between limestone, chalk and marble. Cutting, dressing and the use of natural limestone. Production of artificial limestone, cement, marble-working.

(An interesting film from the technical standpoint; deals chiefly with the marble industry).

N 9101 - *Formation of various strata of soil*: (Film consisting of a combination of drawings and photographs). Decomposition. Transformation of rock into soil. Atmosphere, rivers, glaciers, winds, rains, plants, flora and fauna, all contribute towards the decomposition of rock.

(An excellent general view of the subject).

Group XI. — *Home Industries*.

Group XII. — *Hunting, fishing and trapping*.

N 9059 - *Whaling in the southern seas*: From the Vestfold area to the southern seas. Whalers, whaling, towing, flensing (old style and new style). Colony of penguins.

(An interesting film).

N 9086 - *Codfishing in Norway*: Film taken at Lofoten. Line and net fishing. Different types of boats. Medicinal oils.

(A good film on Norwegian economic life).

Group XIII. — *Agricultural geography.*

N 9017 — *The arid southwestern areas*: Showing the position of the world's hot desert lands. Effects of wind and erosion on the Arizona badlands. Animal and plant life in the desert. Nomadic life of the Navajo Indians.

(A good film of botanical and zoological geography).

N 9034 — *The Philippine Islands*: The capital, Manila. Sugar cane plantations. Bringing in the sugar cane, cleaning and cutting. Drying coconuts. Cleaning and polishing rice. Hemp growing.

(A good study of agricultural geography).

N 9105 — *Wheat-growing in Norway*: Wheat silos at Oslo. Various wheat-growing areas in Norway. Methods of cultivation and harvesting vary in the different regions. State enterprise in wheat-growing.

(A good general view of the subject).

Group XIV. — *Industrial and technical subjects.*

N 9026 — *Hydraulic power*: Electric power and electricity; the hydraulic wheel; high and low tension turbine-propelled generators; the principle of the turbine. Transformation and application of electric power.

(A good general view of the subject, but lacks sufficient detail for a good educational film).

N 9061 — "*Norsk Hydro*". *Hydraulic power*: The waterfall regions: Ost-Telemark and Mosvannet; installation of power stations.

(A good educational film).

N 9062 — "*Norsk Hydro*". *Nitrogen fixation industry*: The manufacture of calcium nitrate at Rjukan and Herøya, electrolysis, Birkeland Eyde arc and Schonherr's process.

(Good education film).

Group XV. — *Films on general educational subjects.*

N 9028 — *Rubber*: Sumatra rubber plantations and the various stages of manufacture. Production of motor car tyres, rubber shoes and fountain pens in America.

(An interesting description of the production and uses of rubber).

N 9094 — *Life in the Sahara*.

(An interesting recreational film).

N 9107 — *Life in the Archipelago*: Building of houses. Domestic animals. Milking cows. Farm workers. Digging for peat. Collecting sea-weed. Fishing, etc.

(An interesting recreational film).

THE FORAGE PROBLEM IN THE UNION OF SOUTH AFRICA

A general study of the causes leading up to the present situation with regard to grazing lands in the Union of South Africa (unsatisfactory exploitation of the veld, changes in the plant cover, soil erosion and soil impoverishment) and the methods to be used for the development of grazing and for obtaining suitable forage for cattle during the whole year (rational exploitation of the veld, laying down artificial pastures, haymaking and ensilage).

I. — Introduction

South Africa is chiefly a grassveld country: over four-fifths of the land are suitable only for pasturage. However, the "artificial grasslands" found in the principal stock-breeding countries of the northern hemisphere, are seldom found in South Africa. Cattle are raised on the natural grasslands or veld, the present flora of which is the outcome of different stages of deterioration or improvement brought about in the original vegetation.

The main forage problem in the Union is irregular production during the year. The innumerable other problems attaching to the utilization of the veld are all more or less affected or modified by the degree of uniformity in production. The ecological, soil and climatic conditions vary to such a degree in South Africa that the solution of these problems is rendered much more difficult than in other countries of the world.

All research work on forage improvement, therefore, necessarily includes a climatological, pedological and ecological study of the country. Only thus is it possible to determine the causes of the present condition of the grassveld and to take the necessary measures for its improvement.

The object of this study is to describe briefly the part played by the climate, soils and ecological factors in bringing about the present forage situation in the Union of South Africa and to indicate the scientific measures to be employed to obtain a more abundant forage production (natural or artificial) distributed over a longer period of the year.

II. — Ecological and Botanical Notes

CLIMATE.

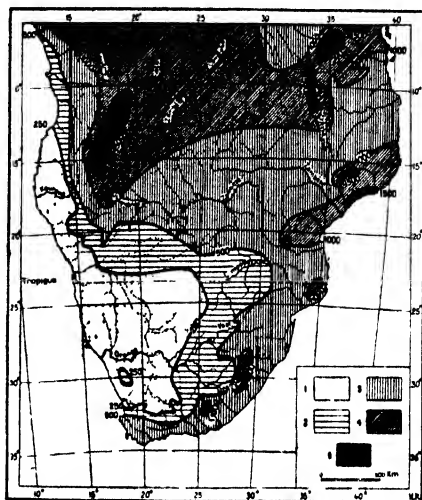
Climate is usually the determining factor in the types of farming followed and vegetation is almost entirely dependent on it.

The average rainfall in South Africa varies from about 50 in. on the Natal coast to less than 2 in. at Luderitzbucht on the west. Fully half the Union has a rainfall of under 20 in. per annum, and only about one quarter receives more

than 25 in. The character and seasonal distribution of the annual rainfall are of much greater importance than its quantity. Over the greater part of the Union, between twenty and thirty per cent. of the rainfall occurs in the form of light showers of doubtful value, the remainder is mainly torrential. The losses due to evaporation and surface run-off therefore are exceptionally high. This type of climate is definitely unfavourable for crop production and makes

DESCRIPTION:	1. =	0— 250 mm.
	2 =	250— 500 „
	3. =	500— 1000 „
	4. =	1000— 1500 „
	5. =	Over 1500 „

(According to the "*Géographie Universelle*,"
Vol. XII, by F. MAURETTE).



the maintenance and rational working of good grassland very difficult. The rainfall distribution divides the Union into three main areas:

(a) The winter rainfall area which comprises the Western Province of the Cape as far as Cape Agulhas. In this region the vegetation is typically mediterranean; the hot, dry summers exclude high forage production.

(b) The all-the-year-round area which comprises the coastal section from Cape Agulhas to Cape Alfred. In the eastern districts of this zone the natural vegetation is mostly composed of gramineae; some perennial shrubs may also be utilized as forage during periods of drought.

(c) The summer rainfall area comprising the coastal areas east of Port Alfred and the inland plateaux. The principal forage centres are to be found in this region.

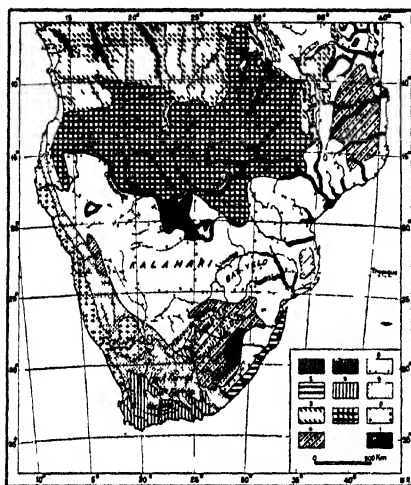
TYPES OF VEGETATION.

Pole EVANS considers that in crossing the Union from south to north, three very distinct types of vegetation are to be found:

(a) From Capetown to Worcester, the vegetation is typical of that found in the winter rainfall area. It consists mainly of evergreen shrubs, with small, stiff, leathery leaves. This region is unsuitable for forage production.

(b) From Touws River northwards to Kimberley, the vegetation is that commonly referred to as "karroo". The Karroo has distinctly a desert or semi-desert character the vegetation consists largely of dwarf shrubs and succulent plants widely spaced in the bare soil. This region is also unsuitable for stock-raising.

(c) From Kimberley northwards, an entirely different type of vegetation is encountered forage plants are abundant and the soil is well covered with them. This zone, which embraces the chief cattle-raising areas, comprises the northeastern portion of the Cape, the greater portion of the Orange Free State, the Transvaal, Natal and Zululand.



DESCRIPTION 1 = Gallery forest, 2 = Sub tropical forest, 3 = High savannah, 4 = Veld, 5 = High mountain meadow, 6 = Mediterranean, 7 = Dry forest savannah, 8 = Bushveld, 9 = Arid steppe Karroo, 10 = Desert, 11 = Marsh

(According to the 'Géographie Universelle', Vol. XII by Fernand MAURETTE)

From the forage point of view, this tract of the Union may be divided into three zones

- (1) A temperate central zone, at a high altitude – the High Veld
- (2) A circular subtropical zone bordering the High Veld on the south-east, the east and the northwest. This zone is situated at a lower altitude and is known as the Middle Veld or Bush Veld
- (3) A low-lying tropical region situated on the eastern coastal belt known as the Low Veld extending northwards to the Limpopo Valley.

(1) *The High Veld.* — This region covers the northeastern portion of the Cape, the greater part of the Orange Free State, the southern portion of the Transvaal, and that portion of the Great Escarpment in the northeastern part of the Cape and Natal which lies above 4,000 feet. The High Veld consists of undulating grass plains. The rainfall varies from 25 to 35 in., the eastern areas receiving the greater fall. Frosts are of long duration and often severe. In winter, the natural pasturage turns brown and loses much of its original nutritive

value. The severity of the winter limits the growth period of the grass and renders it unsuitable as stock feed. The High Veld, therefore, is essentially a region of summer grazing and hay production.

(2) *The Middle Veld.* — The Middle Veld embraces the country which borders the High Veld on the southeast, the east, the north and the west. The altitude of this zone varies between 2,000-4,000 feet. The region includes the basins of the Great Fish River and the Great Kei River, the Transkeian Territories, the midlands of Natal, central Transvaal, part of the eastern, northern and western Transvaal, and the northeastern portion of Bechuanaland. The annual rainfall varies from 25 to 35 in. over the eastern part of the Middle Veld, from 20 to 25 in. over the western portion, and from 15 to 20 in. over the north-western area. Frosts are light and of comparatively brief duration. Compared with that of the High Veld, the pasturage of this region has a long growth period. This, together with the favourable rainfall distribution, makes the Middle Veld the most important cattle-raising country in the Union.

(3) *The Low Veld.* — The Low Veld includes the country which lies below the 2,000 feet contour from the Middle Veld to the coast and to the Portuguese border on the east, on the north it extends to the Limpopo Valley. Along the coast the rainfall averages about 40 in.; in the Lebombo region, it falls to 25 in. and along the Limpopo Valley to 15 in. and sometimes even less. The high rainfall in the southern area gives rise to a luxuriant vegetation; inland, farther north, the rainfall is more concentrated, which results in a rapid growth of pasture, affording good grazing for a limited period. Still farther inland, the growing period, and consequently pasturage, are much more restricted. The Low Veld, therefore, is suitable for pasturage but the further north the shorter the grazing period.

In addition to these three main natural regions, mention should also be made of the Karroo. The importance of forage production in this zone, formerly considered practically a desert, has only been realized within the last few years. The Karroo extends over a large area of the Cape Province. Karroo is the name usually given to arid regions only suitable for goat and sheep raising on a small scale. From the geographical point of view, the Karroo is almost entirely surrounded by very humid regions in striking contrast to it, as aridity is its chief characteristic. This aridity is due to the isolation of the region from the sea by the mountain ranges, which hold back most of the moisture, to the high altitude, where the insolation is very intense, and to the scanty and uncertain rainfall. Evaporation is extremely rapid; in the western part of the Karroo the annual rainfall amounts to no more than 3 to 12 in. The vegetation is composed of elements of the flora of tropical Africa and South Africa.

DISTRIBUTION OF THE FLORA OF THE NATURAL REGIONS OF THE UNION OF SOUTH AFRICA.

Before studying the distribution of the flora (forage plants only will be dealt with in this article) in the different regions of South Africa, attention may be drawn to the migration of pasture grasses in the Union. In general, the pasture

grasses of S. Africa include temperate and tropical species. PHILLIPS groups the vegetation as follows:

1st Group: genera belonging to tropical and temperate plant families distributed in the Transvaal and towards the south, along the eastern and south-eastern coast and extending to the west in the southwestern districts. Their extension towards the west and north is checked by mountain ranges. Examples of these genera are: *Eulalia*, *Eleusine*, *Trachypogon*, *Koeleria*, *Tristachya*, *Holcus*, etc.

2nd Group: genera of the north, limited chiefly to the Transvaal, though occasionally found in Natal. Examples: *Lophachme*, *Dincbra*, *Tripogon*, *Urelytrum*, *Eriochrysis*, etc.

3rd Group: genera belonging to Endopogoneae, Paniceae and Chlorideae; of tropical origin, which from the Transvaal have spread to the eastern and southwestern districts and have also migrated to the west extending over the northwestern and central districts. Examples: *Eragrostis*, *Cymbopogon*, *Hyparrhenia*, *Heteropogon*, *Themeda*, *Panicum*, *Brachyaria*, *Digilaria*, and *Pennisetum*.

4th Group: this group comprises genera of northern origin, which from the Transvaal have spread towards the west; some have penetrated into Natal, while others have migrated further south, though not beyond Port Elizabeth. Examples. *Alloteropsis*, *Schizochyrium*, *Rhaphis*, etc.

5th Group: this group comprises temperate genera belonging to Aveneae, Festuceae and Hordeae. These genera are typical of the southwestern districts; they do not extend beyond East London in the coastal belt. To the north, however, they may be found up to Northern Transvaal, but not in the western area of the Transvaal or in the Orange Free State.

According to PHILLIPS, the migration of pasture plants in South Africa took place in three directions:

(I) The temperate genera migrated towards the north, along the mountain ranges and survived on isolated mountains separated from the main ranges.

(II) The tropical genera shifted towards the south along the valleys, covered the eastern zone and penetrated into the southwestern districts.

(III) Apparently there was another migration of gramineous plants towards the west; these grasses covered the northwestern district and most of the Karroo.

There are about 500 species of pasture plants in South Africa; these species are grouped under 128 genera.

The different veld types which have been mentioned are composed of numerous gramineous species, some of value and others useless. Two species form the basis of the natural food of the stock raised to-day: Rooigras (*Themeda triandra*) and kweekgras (*Cynodon*). Besides these very valuable species, many others are utilized on the different velds. It is impossible in this article to give a complete list of the species and details will be limited to the chief points.

The forage species of the Highveld. — According to P. E. GLOVER, the forage plants of the Highveld may be divided into three main types: (a) plants with only one type of habitat (*Andropogon amplexans* in humid sites; *Myrothamnus flabellifolia* in rocky areas; *Cynodon dactylum* in regions which have been modified in some way and *Trachypogon plumosus* in regions, where no change has taken place; (b) plants which grow profusely in a given type of habitat, but which can be adapted to other different types (*Eragrostis* sp.); (c) plants which do not show any preference for a special type of habitat, for example, *Justicia anagalloides*.

In the Highveld, the gramineae form a thick, continuous covering; they grow in patches only on uneven or hilly ground and in humid districts. There are a large number of species, Rooigras showing a dominating tendency.

Forage species of the Middleveld. — According to R. LINDSAY ROBB, the graminaceous plants most commonly found in the Middleveld are: *Andropogon* spp., *Amphilophis insculpta*, *Antheophora pubescens*, *Aristida* spp., *Brachiaria nigropedata* and *serrata*, *Chloris virgata*, *Cymbopogon excavatus*, *Digitaria eriantha*, *Elyonorus argenteus*, *Eragrostis* spp., *Heteropogon contortus*, *Hyparrhenia* spp., *Microchloa caffra*, *Panicum* spp., *Cenchrus ciliare*, *Pogonarthria squarrosa*, *Rhynchelvtum roseum*, *Schmidia bulbosa*, *Setaria* spp., *Sporobolus* spp., *Themeda triandra*, *Trachypogon polymorphus*, *Tristachya hispida*, *Urclytrum squarrosus*, and *Urochloa* spp.

Pasture plants of the Lowveld. — The forage species of the Lowveld are similar to those of the Middleveld, but, because of the greater heat and the heavier rainfall, the plants usually attain a greater height. A district of the Lowveld which is of particular importance is that bordering on the Zoutpansberg district. The flora of this region is composed chiefly of shrubs, the foliage of which is eaten by cattle, and of *Acacia latukuensis*.

Pasture plants of the Karroo. — Succulent plants are typical of the Karroo. In no other part of the world is such an enormous variety of succulent plants to be found. R. H. COMPTON in the course of his investigations has drawn up a list of the chief varieties. Some have succulent stems and practically no leaves, others have succulent leaves and no stalks, and others grow in the form of clusters of fleshy leaves.

The number of species is very considerable. Besides the succulent plants there are many plants showing signs of geophily. The flora of the Karroo resembles that of other semi-desert regions of the globe in its very low percentage of tall woody plants, chameophytes and hemicyptophytes, but differ considerably in its abundance of succulent, geophytic and even ligneous plants.

III. — Present State of Natural Pasturelands in the Union of South Africa

With the very wide differences in climatic conditions and the altitude at which the natural pasturelands are situated, there is naturally considerable variation in the yield and quality of the forage produced. The present situa-

tion is clearly the consequence of the treatment that the veld has undergone in the past and it is impossible to undertake any improvement work without first studying and determining the causes of this deterioration.

SCOTT concludes from the detailed studies which have been carried out in different parts of the world that forage plants conform to their environment, *i. e.*, they are adapted to the luminosity, soil humidity, temperature, etc. If no external factor intervenes, the plants, by enriching the soil in humus, by preventing excessive evaporation, and inter-competition, can gradually modify the environment in which they grow. Thus, some species will disappear and new types better adapted to the changed conditions will appear. This is known as plant succession. The process is generally slow and gradual, but may be accelerated by farming methods which destroy the optimum growing conditions of the ground cover. When this is more or less destroyed, erosion takes place and the area of denuded and apparently sterile land increases unceasingly.

The solution of the problem therefore, depends on the study of the causes which brought about the modification and, in most instances, the loss of the carrying capacity of the veld, a loss which is made evident by the disappearance of the local ground cover and by the substitution of good quality pasture plants with other inferior species, and on the investigation and execution of suitable measures for restoring and expanding this capacity. To obtain results it will be necessary to study the possibilities of restoring soil fertility, devise a more rational system of grazing with an effective utilization of the herbage, determine the possible relation between veld management and method of stock-raising, employ fertilizers with the dual aim of increasing plant yield and improving the composition and nutritive value of the herbage.

(a) CAUSES OF THE PRESENT CONDITION OF THE VELD.

R. LINDSAY ROBB has clearly explained these causes. The present forage production of the greater part of the Union is low and the quality of the plants mediocre. This fact which was generally attributed to insufficient rainfall and its uneven distribution, appears, on the contrary, to be due to continuous carelessness in veld utilization for over half a century. In remote times, it would seem that the veld deteriorated very slightly, serious deterioration only taking place after white settlement in South Africa. Before the arrival of the settlers, the veld was grazed continuously by wild animals and by native herds; these herds were not large. Both grazed freely on unenclosed land and pasturage was insufficient only in periods of extreme drought. Under these conditions, the intensity of grazing was chiefly affected by two important factors: type of veld and distance from the watering places.

There were two sources of water supply, permanent water available throughout the year and water available only during the rainy season. Cattle and game or wild animals cannot graze much further than five miles from water. With the temporary drying-up of the summer rains, the extent of the pasture

range is reduced considerably and grazing for cattle or wild animals is limited to the areas where a permanent water supply is easily accessible. This limited pasturage must have frequently been somewhat excessively grazed, but as the grass was then practically dormant, possible damage to the ground cover was reduced to a minimum.

The influence exerted by type of veld must have been very marked. The difference in type of veld is mainly due to the seasonal palatability of the grasses and three rather definite types may be distinguished: "sweet", "sour" and "mixed" velds. These terms are in general use throughout the Union. They are only of relative significance and refer in each district to the palatability and nutritive value of full grown forage plants. Sour veld occurs chiefly in the mountainous areas, on the hillsides and seldom in the plains, and then only under special conditions. Sweet veld is found in some regions of the plains. Mixed veld is comparatively rare. The principal difference between the soils of sweet and sour velds is due to the fact that, in the regions with a high rainfall, the greater part of the soluble minerals have been washed out of the soils of the sour velds, while the soils of the sweet velds have retained these minerals, lime in particular, to a higher extent. In the sour veld, owing to the earlier rainy season, the pasture plants begin growing sooner than in the sweet veld and produce a larger quantity of herbage. In the autumn and winter, these plants become woody and have a low nutritive value. In the sweet veld, however, the plants remain palatable even when fully grown and supply good forage even in the winter. In addition, the plants of the sweet veld, at any stage of growth and especially in the winter, are richer in mineral elements than plants of the same species in the sour veld; this is due chiefly to the difference in lime content of the soils of the two types of veld. TAYLOR noted a considerable difference in the lime content of samples of *Themeda triandra* grown in both velds.

The mixed veld is a mixture of the two types, sweet and sour. The influence of the type of veld depends on its earlier history. This leads to selective or zonal grazing, due chiefly to the changes in palatability and feed value of the pasture plants at different stages of growth, caused by the variety of plants of the different veld types and by the seasonal variations in rate of growth. Sour veld can only be grazed for three or four months in spring and summer; sweet veld can be grazed for a slightly longer period, while mixed veld is suitable for both summer and winter grazing.

The effect of selective and zonal grazing on the veld itself is complicated by the fact the various plants of the veld differ considerably in structure and physiological development. For example, some plants have a well developed root-system, and are able to accumulate food reserves which make for rapid renewal of growth after grazing. Others have their leaves protected in such a way that the stock are unable to remove the entire leaf and therefore the accumulation of reserves in the roots can be continued even during grazing. These types are very suitable for summer pasturage and can be grazed several times during their period of growth with little damage. They are naturally green herbage which can be grazed at any stage of growth, without danger of excessive zonal grazing. Others, however, cannot be grazed during the growth period, as, for example,

buffelgras which is found on the Transvaal veld and which suffers considerably if the leaves are consumed by stock at the time of maturity.

In regard to sour veld plants, the position is rather obscure, as the different plants under continuous cropping are either excessively or insufficiently but never moderately, grazed. If a number of stock sufficient to eliminate selective or zonal pasturage is grazed on sour veld, during the period of greatest growth, *i. e.*, in summer, there will inevitably be excessive grazing at the beginning and at the end of summer. On the other hand, if the stock density is low, zonal grazing will take place, leading to the excessive grazing of some plants and to the non-grazing of others. The variations in the structure of the different sour veld plants and the changes produced in the sour veld following grazing indicate that some of these plants are affected to a much higher degree than others by the damage caused by stock grazing during the growth period.

This aspect of the effects of grazing demonstrates that the plants of the sour veld may suffer from excessive grazing, *i. e.*, from repeated grazing at too frequent intervals, and that some good quality forage plants have well defined stages of growth during which even light grazing may cause serious damage. These facts clearly show the consequence of long years of uncontrolled grazing on the present state of the veld and explain the differences found in the degree of herbage deterioration.

INFLUENCE OF SETTLERS ON VELD DETERIORATION.

With the arrival of settlers, changes took place which were destined to play a vital rôle in the evolution of the veld. Land previously unenclosed was fenced and then further subdivided, often without any reference to the type of ground cover. Game and wild animals receded into the more remote areas. Permanent and temporary watering places were extended so as to provide a supply for each division.

Following upon these changes, many areas which previously had been subjected to light intermittent grazing only, were grazed continuously, with little or no regard to the need of rest. Intensity of grazing was thus doubled and even trebled, which inevitably brought about a sharp fall in the carrying capacity of the regions in question.

The fencing in of the land checked the migration of live-stock which formerly changed from the sweet veld to the sour veld in spring and returned to the sweet veld when the sour veld plants had become too coarse. These migrations are only possible now in ranches having the two types of veld, which rarely exist in practice.

The reaction of the original herbage covering to these new conditions was also affected by the system of grazing employed. Three systems of grazing were usually adopted by the settlers, *viz.*, the all-the-year-round system, the deferred system, and the system of alternate camps for summer and winter.

(a) *All-the-year-round system.*

With this system the cattle are restricted to the same area throughout the year; there is only one watering place. This system therefore leads to zonal grazing, certain areas being overgrazed and others insufficiently grazed. Overgrazing near the water supply is common; the more remote areas are grazed more lightly and intermittently in summer, and later, provided that the herbage is not too coarse, in the winter. This system if practised for a long period will inevitably produce local deterioration of the veld, the extent depending on the type of ground cover and perhaps to a smaller degree, the area of land grazed.

(b) *Deferred system.*

This system is not practised to any great extent; a herd is confined to a relatively small area for two or three months in summer, and is then moved on to another area for a further two or three months and so on. This system therefore, allows complete rest of each grazed area, the period of rest extending, according to the duration of grazing, to two-thirds of the vegetative period. The order in which the different camps are grazed may be changed. The data available on the ultimate effects of this system are very limited. The number of animals per unit area naturally determines the intensity of grazing over the whole camp, zonal grazing is not likely to occur. The intensity of summer grazing is comparable with that obtained with the first-mentioned system, the only difference being in the periodicity of grazing.

(c) *System of alternate camps for summer and winter.*

This system has been more generally practiced than the deferred system. The winter camp usually consists of sweet veld, but this is not always the case. Understocking of the summer camp produces zonal grazing; excessive grazing adversely affects the grass cover and in any case reduces its vitality considerably.

On comparing the effects of the different grazing systems on the vegetation, it is evident that in the first system the number of head of cattle determines the relative extent of the seasonal grazing zones and, to some extent, the intensity of late winter grazing. In the second system, the number of head per camp determines the intensity of grazing over the whole area. Zonal grazing is infrequent, as grazing is more intense and the utilization of the camps more uniform. With the third system, the summer camp tends to be homogeneous while the winter camp, when it is insufficiently grazed, develops like the areas grazed according to the first system; intense grazing gradually produces a greater uniformity in the camp grazed in summer and then the number of head of cattle will determine the intensity of grazing.

All these grazing systems have been complicated by veld burning

VELD BURNING.

According to the information available, it appears that formerly the unconsumed surplus grass was burned off by the natives each year, either accidentally or intentionally. This practice was probably adopted by natives to facilitate hunting; the effects observed no doubt led to the general practice of veld burning in order to remove the useless dead herbage and thus accelerate the new growth in the spring.

The question arises as to what effect veld burning had on the deterioration of the natural grasslands, and whether this practice should be continued. Research workers have not yet come to any agreement on the value or otherwise of veld burning; the majority consider that the both immediate and permanent results are more harmful than beneficial. Experiments on this problem have been carried out at the Cedara School of Agriculture since 1921. The object of veld burning is to remove old growth and facilitate the development of young, green herbage from the burnt stumps. It is usually practised on sour veld where the accumulation of unpalatable fibrous forage plants constitutes a serious problem for stock-breeders. The question of the effect of veld burning is worth studying from the following points of view: ecology, hydrology and veld management

(a) *Ecology.*

There is every evidence that the indiscriminate burning of plant growth has brought about considerable changes in the flora of South Africa though these changes appear to be more serious and permanent in the case of forest land than of grassland. In the latter case, by appropriate means, it would seem possible to restore this vanished flora. Attention may also be called to the regional influence of burning. The change in flora caused by burning is largely influenced by local conditions and generalizations on this question should be avoided. The effects of burning vary according to frequency of burning, type of grassland, time of burning and the prevailing climatic conditions

(b) *Hydrology.*

As yet, no decisive studies have been made in South Africa on the relation between the burning of the vegetal cover and the loss of water due to run-off, evaporation and other causes. In recent years, however, local research work has apparently proved that, in this respect, the practice of burning should be, in nearly all cases, abandoned.

Experiments have shown that the winter burning of the veld favours leaching of the soil surface; this effect will evidently vary according to region, and further experiments are necessary in order to determine these variations. The results obtained, however, confirm that burning also causes direct evaporation and has probably, together with various other factors such as excessive grazing or other injurious forms of veld utilisation, contributed to the drying out of the soil, a common feature in some districts.

(c) *Veld management.*

Controlled burning is often necessary in veld management as a means of removing the excess fibrous, useless vegetation of low nutritive value. The dried up forage of the previous years is often refused by cattle, and mixed with fresh pasture is only of mediocre value. The problem of removing this excess herbage is a difficult one. Burning does not appear to be a profitable solution, on the other hand, there are economic objections to mowing, hay-making and ensilage. In practice, it would be very difficult if not impossible to abandon the system of burning. In view of the very limited reserves of water in the soil, however, it is important that burning should be practised with caution and only in cases of absolute necessity.

The practical results of the experiments conducted at Cedara showed that burning when practised during the period of vegetative rest (from May to September) had a more or less beneficial effect on the quality and the composition of green cover; according to these experiments, the most suitable period for burning is just before the spring rains; carried out during plant growth, burning will undoubtedly have an injurious effect, the maximum damage occurring when its practised in mid-summer. It was also noted that the accumulation of excess herbage has an adverse effect on the veld if left unburned for more than two years.

These experiments also showed that the practice of burning might cause serious damage and that it should be employed with caution at a suitable time and only when indispensable, chiefly for the removal of old, unpalatable pasture.

As a protection against sudden bush fires, the farmers often lay out strips of land from 33 to 50 feet wide, which are maintained free of all vegetation. Fuller protection may be obtained more easily by planting rows of trees around the fields. For effective protection at least six rows of trees should be planted, the rows being spaced 6 feet apart, with the trees at a distance of 6 feet from each other. This fairly dense planting will allow little penetration of light through the foliage of the trees and thus prevent the growth of small shrubs and other plants which would spread fire quickly. The following varieties are considered the most suitable: *Eucalyptus* sp., *Acacia melanoxylon* and *Casuarina cunninghamiana*.

SHIFTING CULTIVATION.

The natives and the settlers have caused veld deterioration by practising shifting cultivation. It was the custom to clear parts of the veld for crops and continue cultivation until the soil was exhausted; these fields were then abandoned and others cleared, and so on. The abandoned areas where the soil was no longer fertile enough for cultivation were exposed to the dangers of erosion. They lost any remaining fertility and gave rise to the large stretches of bare and waste land seen in the South African veld. At best, a new veld cover grew consisting chiefly of weeds providing herbage of poor value in comparison with the original pasture.

Conclusions.

An attempt has been made to describe briefly the causes which have brought about the present condition of the grasslands of the Union of South Africa. These causes may be summed up as improper utilization of herbage, leading to the disappearance of the best forage species, their substitution by species of lesser value and the gradual extension of soil erosion and soil exhaustion. These effects became prominent after white settlement in South Africa, when livestock could no longer shift freely from one grazing area to another, according to season and water supply, but were kept in enclosed fields.

J LEGROS.

STANDARDIZATION OF FRUITS AND VEGETABLES

The Committee of horticultural experts, which met in Rome in December, 1937, considered that one of the most important parts of the programme of the recently formed Horticultural Section was the organization of a survey of the standardization of horticultural products in the various countries. This survey was commenced in the spring of 1939 and 36 countries have already replied. The answers received show that 32 countries have already adopted measures for standardizing their products and the information supplied is extremely interesting. It is proposed to publish a series of articles on the work accomplished so far, beginning with an introduction on standardization in general, followed by a review of the methods adopted up to the present by the various countries and concluding with a general summary.

Introduction.

Economic importance standardization. — Before commencing a detailed study of the subject, it is well to define what is meant by standardization. In "The Economics of Marketing", Killough says "Grading is the separation of goods into uniform classes and lots. Goods are said to be standardized when grades and classes are so exact and in such common and widespread use that their purchase and sale may be consummated by description and without inspection".

This definition presupposes that measures standardization of will be taken either by the authorities or by large groups of producers or merchants. If the objective in view is to be attained, these measures must in the first place be carefully studied. Standardization was originally confined in most countries to

the regulation of currency, weights and measures. In the course of time, however, it was realized that more extensive standardization was extremely important from the economic standpoint. Standardization is also of great value from the point of view of cost and its influence is seen in manufacture. When the number of types of an article are reduced, considerable saving is effected, with advantage not only to the producer but also to the merchant and the consumer. The following is an example: "In 1920 the Regal Shoe Company of Whitman, Mass., had 2500 styles of shoes with an average price of \$ 10.96. As a result of research it is now around 100 and there is a flat price of \$ 6.60 a pair on all shoes manufactured. Economies from simplification, together with the increased volume of business, made possible the selling of shoes at this price".

It may therefore be asserted that more extensive standardization of types of goods – and this is true for agricultural and horticultural produce as well as for industrial goods – complying with an exact specification of their characteristics from the stand point of quality, guarantees a better return to the producer, facilitates distribution and ensures a better product more closely corresponding to the consumer's requirements. Foreign buyers also prefer to purchase goods graded by quality and standardization is thus bound to have a good effect on exports.

Standardization in industry, agriculture and horticulture. — The standardization required in the industrial field is entirely different from that required in agriculture and horticulture owing to the different conditions of production. In industry, quite apart from geographical position and the personality of the producer, it is possible to manufacture goods conforming to certain specifications fixed in advance, the measurements, weight and quality being clearly defined, every article being absolutely identical and produced in quantities limited only by the capacity of the plant.

The standardization of industrial products is therefore a fairly simple matter. The case of agricultural and horticultural products is quite different. The most appropriate measures concerning the choice of plants and seeds, the working and manuring of the soil, etc., will not ensure the production of absolutely uniform products nor exact conformity to regulations stipulated in advance. There are too many factors beyond the power of human control, such as climate and its influence on the growth of plants and the variable nature of the soil in the various areas of production. Moreover, the activities of the producer himself are of the utmost importance; there are legions of producers and their efficiency varies widely. In agriculture and horticulture, therefore, even more than in other cases, it is important to know the characteristics of the produce ordered without being obliged to make previous investigations. It is obvious, however, that standardization must be regulated on quite different lines from those followed in industry. Industry produces on the basis of regulations established in advance. Agriculture and horticulture have to be content with the grading of the goods produced. Industry, again, can always classify its products at the source. However desirable, this procedure is not always feasible in the case of agricultural and horticultural products. It often happens that the whole crop is purchased

and the produce graded only after reaching the marketing or consumption centre. If the transformation of the crop were in the hands of the producer, it would then be preferable to grade produce at the source, where the sorted goods could be warehoused, sold and despatched directly to the consumption centres. This procedure would be more logical and also less expensive. The labour of the producer himself could be used at a low wage with the result that he would improve his position from the commercial standpoint and would, at the same time, be ensured a better return for his work.

Advantages of standardization in agriculture and horticulture. — The following summary of the advantages accruing to agriculture and horticulture from standardization will give a clear idea of the importance of the latter.

Good standardization makes it possible to eliminate sample taking, thus simplifying trade and encouraging more efficient distribution with a saving in time and costs. The saving of time speeds up delivery, a very important factor when handling perishable goods. The merchant does not lose by this, in fact, it is all to his advantage, while the producer and consumer also benefit, the former because he is better paid and the latter because he is better and more easily served.

It thus becomes possible to deliver the goods to the consumption centre direct instead of through the central market, and transport costs are thereby reduced. The consequent saving of time and expense is considerable, especially in countries where distances are great. This is probably one of the reasons why the United States was among the first countries to adopt standardization.

When standardization is done at the source it is possible to avoid the expense of transporting products discarded during sorting, another advantage of sorting goods according to quality is that large supplies of uniform quality are obtained. The demand for such goods is also firmer, as experience shows that, as long as there is no difference in quality, the public prefers goods of a uniform aspect to products presented in an untidy form. Standardization also facilitates warehousing and storage. When goods are not graded the various lots have to be stored separately, while standardized goods belonging to the same grade can all be stored together. A classic example of this is seen in the elevators in the United States wheat areas, where the grain from the various growers is first graded and then collected. Consequently, all the owner requires is a number of divisions in his elevator corresponding to the number of standard qualities of wheat grown in the area served.

Standardized products tend to reduce commercial risk because their quality can be clearly indicated and they can be kept and sold when a suitable moment arrives, thus obviating the locking up of capital over a long period.

Due weight should also be given to the educative value of standardization. The producer learns to cultivate the products preferred by the consumer. When there is a steady demand for a certain quality at a given price, efforts are made to put this quality on the market. If there is a constant demand for the cheaper qualities, a saving can be made in the labour and expense involved in growing luxury products.

Standardization shows the producer whether his crop has been successful, because he can compare his percentage of good quality products with the percentages obtained by his fellow producers. It also helps to develop the salesman's and the consumer's knowledge of the goods handled and purchased and leads to better distribution and a more active market. Experience shows, for instance, that sales are stimulated if apples are sold according to variety and grade.

Again, standardization helps to make a breach in the semi-monopolies practised by some firms. It is a well-known fact that some firms, especially those which are known to supply good quality produce, market the articles under their name or trade mark which serves as a protective wall. Standardization knocks down this wall because standardized products can be sold by any firm, once their quality has been fixed. Consequently, it becomes impossible for firms to set too high a price on the strength of their reputation for selling good quality products, or for other firms obtain a better price for inferior produce than would be possible if the quality were indicated by grades.

The advantages of grading by quality have been recognized by many countries and a number of them have already adopted measures to encourage this system.

Characteristics of good standardization. — Good standardization must satisfy certain conditions:

(1) In the first place, the characteristics of standard samples must be established; these must be indisputable and consequently it is essential that all the interested parties should be agreed on the standard samples.

(2) The determined categories into which the products are divided must be clearly fixed in advance.

(3) Wherever possible the classification of the various types must be fixed on a basis of intrinsic qualities or at least on their external appearance.

(4) Once the different types have been fixed, the products must be strictly checked on delivery by disinterested parties.

(5) In many cases it is advisable to standardize the packing as well as the product. This facilitates carriage and warehousing in cold storage or elsewhere: there is also a consequent reduction in the price of the material used and in the cost of the actual work of packing; lastly, the goods are presented in a better and more uniform manner.

(6) Wherever possible the standardized product must always be kept in stock and must not be too expensive.

Obstacles to standardisation. — It will never be possible to standardize every product, as certain products have characteristics peculiar to themselves. Moreover, it would often be difficult to standardize very bad products.

The introduction of standardization will inevitably encounter many difficulties. One of the chief of these is the opposition to be expected from certain producers who find it troublesome, from traders who foresee the disappearance of the individual standards on which they based their high prices and from the consumer who fears too much uniformity. There is indeed a serious risk that a

too the pronounced effort towards standardization may lead to excessive uniformity resulting in "mass production", satisfying the minimum requirements and stifling every attempt at improvement.

Consequently, standardization must be controlled by broad-minded persons who are always ready to adopt improvements on existing methods. It may happen, for instance, that too many varieties of apples are cultivated, making it necessary to restrict the number: the planting of new varieties should not be entirely stopped, however, because, although the assortment must be limited, it must also be improved.

Many years will have to pass before standardization is introduced everywhere. This was foreseen by Professor RITTER who divided products into four different groups:

(1) Products which require no alteration and for which grading is sufficient: *e. g.* eggs.

(2) Products for which, steps must be taken at the source of production in order to obtain the desired result.

In order to obtain a uniform quality of butter, for instance, special feeding for milch cows is necessary

(3) Products which must be selected at the time of planting; in such cases, at least a year is necessary. A good example is potatoes. Not only must high yielding plants be used but the number of varieties must be reduced, as has already been done in Germany.

(4) Products for which it is desirable that production methods should be transformed. In the case of the production of apples and pears, for example, the process of transformation will take a number of years.

* * *

A study of the standardization measures adopted in the various countries is of great value and may help to solve some of the difficulties and lead to a unification of methods.

In the following articles an examination will be made of the measures taken by the various countries, which will be considered in French alphabetical order. The information thus obtained will be subdivided as follows:

(1) *Products*. — Lists of fruits and vegetables for which standardization measures have been adopted, indicating whether these measures are applicable to export products, or whether they are also applicable to products sold on the home market. Mention will also be made of other products for which grading by quality is under consideration.

(2) *Standard samples*. — Description of the characteristics of standard samples used as a basis for the various categories.

(3) *Packing*. — List of products for which packing methods have also been standardized and a description of these methods.

(4) *Rules for standardization.* -- Indications whether standardization is optional or compulsory, whether it is controlled by the government or by individuals, whether rules have been gradually made more stringent or whether present regulations were applied in their entirety from the outset. Mention will also be made of the laws, decrees, circulars or orders governing standardization.

(5) *Control.* — Description of the control system, methods adopted for preventing infractions of the regulations, and the manner in which the observations of the controlling staff are brought to the notice of producers.

(6) *Consequences of standardization.* — Indications whether the quality of standardized goods has improved.

(7) *Imported products.* — Indications as to whether standardization methods are also applied to imported products.

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Measures of standardization adopted in various countries.

1. — Italian Africa: Somaliland.

1. — In Italian Africa standardization measures have been adopted in the case of bananas; these measures are applicable to exported bananas and not to those grown for home consumption. The standardization of other products is not contemplated.

2. — Grading by quality is based on the weight of bunches and comprises six categories. The weight varies from 10 to 38 kg. per bunch.

3. — Packing of bananas is also standardized. The fruit is packed in octagonal crates.

4. — Standardization is compulsory and all regulations have been issued by the Government.

When grading was introduced, intermediary weights between the six standard categories were accepted but bunches must now conform to one of the six standard categories.

The measures introduced are based on the Government Decree No. 9877, August 28, 1933-Year XI of the Fascist Era.

5. — Control is exercised by specially trained inspectors belonging to the Royal Banana Monopoly (Reale Azienda Monopolio Banane). The result of checking is communicated to dealers, as the measures are applicable to them and not to the produces. Dealers are grouped in the R. A. M. B., which is an official body.

6. — From information received it does not appear that the quality of the product has been noticeably improved as a result of these measures.

7. — As no bananas are imported, standardization of imports has not been provided for.

2. — Germany.

1. — Standardization measures have been adopted in Germany for the following products:

Hard fruits: apples, pears;

Stone fruits: plums and quetsches, apricots, peaches, mirabelles, green-gages, cherries and morella cherries;

Soft fruits: strawberries, currants, gooseberries, raspberries and blackberries, bilberries and whortleberries;

Vegetables: cauliflowers, french beans, dwarf beans, scarlet runners, broad beans, peas, gherkins and cucumbers, kohlrabi, kale, cabbage (white cabbage, red cabbage, Savoy cabbage), cabbage for sauerkraut, Brussel spouts, horseradish, carrots, leeks, radishes, black radish, beetroots, rhubarb, salads (cabbage lettuce, endive, corn salad), scorzonera, celery, asparagus, spinach, turnip tops (Stielmus), Teltov turnips (Teltover Rübchen, *Brassica Rapa Teltoviensis*, Alefeld), tomatoes, onions.

Standardization of products and their packing is applicable to merchandise to be marketed within the country as well as to exports.

Fruits and vegetables which do not comply with the regulations governing categories and qualities for direct consumption, may not be sold and must be marked immediately as being for industrial use or for fodder. Besides the products indicated above, standardization is contemplated for nursery and market plants.

2. — *Fruits*. — Apples and pears are graded by size and also divided into 4 classes:

1st class A: extra.

Class A: Dessert fruit, 1st quality.

Class B: Commercial fruit, 2nd quality.

Class C: Fruit for industrial use.

Class C is also subdivided into 3 sub-classes and thus all qualities are provided for.

Plums and quetsches are divided into two classes only, the first being reserved according to the stage of ripeness, either for direct consumption or for industrial purposes. The second uncludes only fruit for industrial purposes.

Apricots are divided into three classes, according to size and quality. Peaches are graded in the same way.

Greengages are divided into ripe fruit and green fruit which is still hard. Each of these two groups, which are very similar, is divided into two categories of quality.

Sweet cherries are divided into four qualities: extra, first, second and third grade. The last is reserved for industrial purposes. The different classes must comply with very clearly defined rules governing quality.

Morella cherries are graded in the same way.

Strawberries are divided into three quality grades; the first is subdivided into three different sizes.

Currants are divided into two qualities according to the stage of ripeness, colour and degree of cleanliness.

Gooseberries are divided into three classes: ripe, half-ripe and green fruit. The first class is subdivided into ripe fruit for the table or for industrial use and fruit that is either more or less over-ripe or of irregular shape and size, such fruit being used for industrial purposes.

Raspberries and blackberries are only divided into extra and first quality fruit.

Bilberries and whortleberries are divided into first and second quality fruit, according to whether the berries are ripe, cleaned of their leaves and dry or otherwise.

Vegetables. — Cauliflowers grown under glass are divided into two qualities according to shape, colour and firmness. Each quality is subdivided into 5 categories based on the diameter of the flower.

Field cauliflowers are divided into three qualities, the two first being similar to the two qualities of those grown under glass, while in the third quality plants are also accepted even if slightly worm-eaten. The first two qualities are also divided into 5 different diameters which are, however, larger than those for the previous variety. Diameters may vary in the third quality

Dwarf beans are divided into varieties grown under glass and varieties grown in the open which, in their turn, are each divided into two qualities. Scarlet runners, broad beans and peas are also divided into two qualities.

Broad beans are divided in the same way as scarlet runners. Peas are divided into two qualities.

Frame-grown gherkins and cucumbers and those grown in the open are each divided into two qualities according to length, size and any possible defects. There is also a distinction between gherkins for pickling and large salad cucumbers.

There is only quality of kohlrabi grown under glass but it is divided into three classes, according to size. Kohlrabi grown in the open is also sold in one quality only which is subdivided into four size groups.

There is only one quality of kale.

Cabbages (white, red and Savoy cabbages), are grouped into two categories; in the first category, besides conforming to certain requirements as regards quality, they must have a minimum weight; in the second the quality and weight standards are lowered.

Kraut cabbage must satisfy certain rules as to quality and weight. Burst "heads" which are, however still good kraut, may be marketed under the heading "burst" (geplatzte Ware)

Brussels sprouts are grouped into two qualities, medium in one group and large and small heads mixed in the other.

Horseradish is divided into two classes: the first class is divided into four grades, according to weight.

Carrots, of which only the hothouse and early varieties are distinguished, are grouped in two qualities; the first is subdivided into groups according to size, which varies according to the season. There is only one quality of red carrot, divided into two size categories.

There is only one quality of leek, divided into four size groups

Radishes are divided into two qualities, the first being divided into two size groups.

Black radishes are similarly divided

Red beetroots are divided into the round and long varieties. In both cases there is only one quality, subdivided according to size into three classes for the round variety and two classes for the long variety.

There is only one quality of rhubarb divided into two size groups.

Salad (cabbage lettuce, endive and corn salad) is divided into two qualities

Scorzonera is delivered in two qualities the first of which is subdivided into two size groups.

Celery is also divided into two qualities, the first of which is subdivided into three size groups.

Asparagus has been very carefully classified; no heads may be more than 24 cms. in length and they must be cut straight across the stem. Eating asparagus must be washed while that for industrial purposes may be unwashed.

Eating asparagus is divided into 5 qualities; extra, first quality, blue class with blue tips but corresponding in every other particular to the two former qualities, second quality and third quality. The qualities are differentiated by size, weight and appearance.

Industrial asparagus is divided into four groups, the requirements as regards appearance being slightly lower than for eating asparagus; weight and size requirements are the same as for the eating variety.

Frame-grown spinach is delivered in extra, first and second qualities, spinach grown in the open in one quality only.

Forced turniptops (Treibstielmus) are divided into two qualities according to length and weight; field-grown turniptops are marketed in one quality only (Frilandstielmus).

Teltov turnips (Teltover Rübchen), are divided into two qualities, the first of which is subdivided into two classes according to size.

Tomatoes are classed in three categories; the first includes two different sizes; the second, three sizes, the first of which is a mixture of two sizes of the first quality. No size distinction is made in the third category.

Onions are divided into three qualities, the first of which is subdivided into three classes according to size, there is also a combination of the three classes. The second and third qualities have no size distinction, but there is a minimum size limiting the second quality.

3. — Grading according to quality and size must be clearly indicated by means of labels. Labels must be in the following colours. white for extra quality, red for first quality, yellow for second and blue for third quality. Sizes are indicated by figures on the labels. If not otherwise regulated, departure from the prescribed quality must not exceed 10 per cent. in the case of each quality, and lot. There are also regulations concerning packing and forwarding for certain products. There are several different types of cases and crates, each of which is made to contain a given weight; each case or crate may contain only one type and quality of product. For bulk shipments by rail, for instance, only a limited number of varieties may be forwarded at one time and these must be separated from each other by partitions.

Products for industrial use may be packed as agreed by the producer and the manufacturer.

4. — These regulations concerning the standardization of vegetables and fruits and for their packing are published in booklet form and must be considered as used in trade and compulsorily applied. Regulations concerning standardization are published irregularly in all important trade journals. In certain cases special booklets are also issued.

There are no legislative measures requiring standardization except for certain products such as asparagus, cabbage, onions, stone fruits and soft fruit. The other regulations are issued by order of the Hauptvereinigung der deutschen Gartenbauwirtschaft. This organization has drafted all the measures concerning the grading and packing of products and has helped to bring them into common use. The regulations are improved and added to yearly.

5. — Control of the enforcement of grading and packing regulations is exercised by an expert official belonging to the horticultural associations. In case of dispute, another competent official is consulted. The results of the checking are entered on delivery cards and forwarded to the interested parties.

6. — The quality of the fruit and vegetables placed on the market has been considerably improved by standardization.

7. — No regulations are applied to imported fruits and vegetables.

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MISCELLANEOUS INFORMATION**Potato haulms as a source of cellulose in Germany.**

The haulms of the potato plant is one of those by products of agriculture that is very badly, if at all, utilised and is in many cases just a nuisance. Sometimes they are scattered over the land as manure or they may be made into composts; in farms where there is a lack of straw they may even be used as litter and, where root crops occupy a large proportion of the area of the farm, they may be used for covering the silos but in this case attention must be paid to the danger of infection with *Phytophthora infestans* the spores of which are very resistant. On small farms in poor districts the haulms are used, either dry or green, as fodder. When buried in the ground they rot slowly and badly and it is not seldom that they are merely burnt. Attempts are now being made to utilise them as a source of cellulose.

The R. K. T. L. estimates the production of potato haulms in Germany at 2,000,000 tons per year. E. LEHMANN and R. HORNKE admit that the dried haulm of a potato plant has an average weight of 20-35 g, reckoning the weight as 30 g, the quantity of potato haulms would be between 2,200,000 and 2,700,000 tons, a figure not far removed from the estimate of the R. K. T. L.. F. SCHUNDT and G. WEHNER by direct weighing have obtained the following figures for the yield per hectare of the haulms of the following varieties. "Robinia" 34 tons, "Ostbote" 50 tons, "Parnassia" 12 tons, the figures referring to green material. Supposing the moisture content be reduced from 77 to 10 per cent. the yields are 11.3, 16.6, and 4.0 tons giving an average of 10.6 tons per hectare; now the area devoted to potato cultivation in the old Reich is 2.84 million hectares and on this basis an estimate of 30,000,000 tons is obtained which, however, seems too high.

The use of these haulms raises a number of problems and first of all that of the labour supply. F. SCHMIDT and G. WEHNER have carried out a series of trials to find the effect on the demand for labour. Pulling them by hand requires 80—100 hours work per hectare, the work is laborious with the result that the extra personnel necessary for harvesting the potatoes will not do it. Further a proportion of the potatoes is removed when the haulms are uprooted and has to be collected separately. Cutting with a sickle requires 50 to 70 working hours and with a scyth 40 to 60 working hours, with a mower it can be done in 8-10 man-hours plus 8-10 horse-hours.

Cutting with a mower allows an economy of time in comparison with hand pulling but it must be noted that 7.2 tons of green haulms per hectare can be obtained in this way whereas 34 tons may be obtained by hand pulling and a subsequent harrowing is necessary to collect the rest after the potatoes have been harvested. In order to economise labour it is advisable to allow the haulms to dry partially for several days before loading them. If delivery must take place in the autumn, drying may be carried out by spreading the haulms in the field. For delivery in spring 5 heaps are made with one cart load. The thick stems allow a circulation of air that is sufficient to prevent rotting and drying is satisfactory.

To preserve the haulms during the winter they may be stacked and covered with straw or kept in barns or simply used for covering potato silos or stacks of root crops. The haulms may be delivered in bales made in a straw press. F. SCHMIDT and G. WEHNER calculate that the cost of handling per ton of dried haulms is as follows (Labour 0.50 RM per hour and horse traction 0.75 RM. per horse per hour.

Cutting and transport	7 80 RM.
Loading and transporting to straw press 2 kilometers away (loads of 600 kgs)	3 40 "
Pressing (15 tons per hour)	4 50 "
<hr/>	
Total . . .	15.70 RM.
Deducting expense of removing the haulms as being necessary in any case	3 10 RM.
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Net cost . . .	12 10 RM.
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The question is one of cost and not of selling price

The haulms must not be cut too long in advance or the yield of tubers is not impaired, the preliminary cutting makes the work of digging the potatoes considerably easier especially in fields where the vegetation is very vigorous and, in this way, a part of the labour cost may be recovered, this is still, however, a problem that remains to be solved.

In the autumn of 1939 the sale of dry potato haulms was organised by societies of potato growers, they had to be delivered in bales bound with iron wire. As it is no longer possible to obtain straw presses the potato growers societies organised mobile columns which transported the presses from place to place so that long transports of the haulms were avoided. The maximum moisture content permitted was 17 per cent. Those which had been used for covering silos or which had been spread out in the fields in the autumn were also collected and pressed. The price paid was 27.5 RM. per ton of haulms baled and loaded on the cart or 20 RM for loose haulms delivered to the nearest straw press. Already in 1921 a patent had been taken out in Germany for a process for extracting cellulose from potato haulms but it was not successful, the pulp obtained being of little value, since that time further research has been carried out with equally poor results.

In 1934 and later in 1937 E. LEHMAN and R. HORNKE took up the question again and seem to have achieved interesting results.

The haulms can be treated with soda or with bisulphite, in both cases they are cut into small pieces 3 to 5 cms long, washed and pulped in a stream of water and finally sieved. The preliminary treatment is to reduce the ash content. The sieved material which represents 60 per cent. of the original weight of haulms is then treated with a 5.5 per cent. caustic soda solution for an hour and a half at 135—140° C or with a 5.0 per cent. bisulphite solution for eight hours at 135—140° C. In the first case the yield is 28 per cent. and in the second 33 per cent. of the weight of haulms treated. The cellulose is of good quality and may be used for the manufacture of artificial silk or wood wool.

The by-products may be used in the preparation of composts.

A. H.

The Encouragement of Horse Breeding in Switzerland.

The new regulations of the Swiss Federal Council lay down that all activities in connection with the encouragement of horse breeding in Switzerland, hitherto in the hands of the Zootechnical Section of the Federal Department of Public Economy, Agricultural Division, will be, from April 1, 1940, in the charge of the Federal Stallion Depot at Avanches.

This change modifies the data given in the article on the organisation of horse breeding in Switzerland given in this *Bulletin* No. 10, 1939, p. 361. T.

I. M.

The Registration of Arab Horses in Syria.

The *Journal Officiel* of the Syrian Republic (N° 6. September 14, 1949) publishes the decree N° 177 which deals with the registration of pure bred arab horses in an official register. According to the regulations laid down: (1) a register will be instituted for pure bred arab horses in Syria (2) a second register will be instituted for births and the registration of the foals of sires and dams in the former register.

A commission will go at an appointed time to the different horse breeding centres to choose the mares and stallions now in Syria that are worthy of inclusion in the register. From October 1 the registration of all births from stallions and mares in the stud book will be compulsory within 15 days of foaling. The first volume of the stud book will be printed and published at the beginning of June 1940.

In view of the difficulties of obtaining breeding stock of pure arab blood the above decisions are bound to have a valuable effect on the raising of this important breed.

I. M.

Model Fattening Establishments in Hungary.

With a view to the encouragement of breeding and increasing the rational fattening of cattle, the Royal Hungarian Ministry of Agriculture has set up four model fattening establishments, all in the Great Plain of Hungary. The organisation has been entrusted to the *Hangya* Association which runs them on the most appropriate lines and organises demonstrations for small breeders in order to make known the progress of rational fattening. Each establishment has more than 50 head of stock.

I. M.

The distillation industry in Uruguay.

The following interesting details are extracted from a lecture by Prof. P. MENÉNDEZ LEES of the University of Montevideo given at Buenos Aires on August 12, 1938.

The distillation industry of Uruguay is an important one, for the annual consumption of alcohol within the country is approximately 9,000,000 litres which includes both potable and industrial alcohol.

The former must be further subdivided into two types, wine and spirits derived from grapes or wine and by-products and Caña the Uruguayan national drink which is prepared by the distillation of fermented liquor derived from honey, molasses or sugar cane; the consumption of this beverage alone amounts to about 3,000,000 litres 50 per cent. spirit per year.

Another popular drink is grappa or marc alcohol. The sale of this drink in 1938 about 1,200,000 litres of 50 per cent. spirit.

Wine alcohol is used to raise the alcoholic content of wine in the manufacture of liqueurs and brandy, a law prohibiting the use of other raw materials in the manufacture of the latter.

The consumption of industrial alcohol in Uruguay in 1938 nearly reached 5,000,000 litres of which the greater part, about 70 per cent., was denatured. The latter is available for many different purposes for it may be 87, 91 or 96 per cent and may be denatured in a special manner for certain purposes. 30 per cent of the remaining industrial spirit sold as rectified spirit of wine 96 % for the manufacture of liqueurs and pharmaceutical preparations and for raising the alcohol content of certain wines.

In studying the alcohol industry in Uruguay two distinct periods must be distinguished, before and after the application of the law of October 15, 1931. In the former period the industry was free and in the hands of private undertakings with no intervention from the State except as regards taxation.

There were several distilleries for the production of rectified spirit, 4 being in the department of Montevideo and having capacity for a total monthly production of 5,400,000 litres, 2 in the department of Canelones with a monthly production of 200,000 litres, one in the department of San Jose and one in the department of Colonia, each being able to produce 195,000 litres per month.

In all, the country could have a monthly production of 935,000 litres of 96 per cent. spirit but even before 1931 several of these distilleries were not working.

The natural alcohol is either imported or manufactured in the country. In the period preceeding 1931 "grappa" was only consumed at the comparatively low rate of 300,000 litres per year. In 1903 a scheme had been mooted for the sale and manufacture of alcohol by a State monopoly, this being considered in the public interest. A similar scheme was announced in 1921. These measures were directed towards a reduction of the annual imports; the imports in 1921 of alcohol, mineral burning oil and petrol exceeding 6,000,000 pesos. In 1923 and 1924 changes were made in the suggestions but it was not until 1931 that the law was finally promulgated.

This law set up an Administracion Nacional de Combustibles Alcohol y Portland (the A. N. C. A. P.) which was to exploit and administer the monopoly of alcohol and national fuel, to rectify and sell petrol and derived products and finally to manufacture Portland cement.

At the present time the Administration has two industrial organisations with well defined spheres of action: the Subdirectorate of Fuel and the Subdirectorate of Alcohol, a third concerned with the manufacture of Portland cement is now being set up.

The A. N. C. A. P. directs two sections of agricultural production, the wine industry for potable spirits and maize cultivation for the production of the raw material for the manufacture of rectified spirit and denatured alcohol.

Article 5 of this law lays down that stills already in existence may continue the distillation of wine marc and fruit produced in the country but only under conditions fixed by the Directorate of the Administration and with primary alcoholic material prepared on the same premises. The creation of new stills may be authorised under certain conditions and the alcohol produced in these stills will be purchased by the Directorate at prices that depend on the alcohol content.

The consumption of alcohol after this law underwent considerable changes. Although no propaganda in favour of increased consumption was made, quite the reverse, there was a considerable increase in the consumption of "grappa". In fact under the conditions obtaining in 1929-1930 the consumption of this drink was 306,647 litres and the revenue on these sales was, in round figures, 46,000 pesos, in 1934, however, consumption had reached 847,000 litres and the corresponding revenue for the government was 127,100 pesos, by 1937 the figures were 1,185,900 litres and 233,300 pesos. The consumption of this drink is still increasing and is due to a development of the taste of the consumers and a very definite increase in the quality of the alcohol which is the result of the Monopoly.

New changes and improvements in this organisation were made by the decree of the Executive Body on July 8, 1937. Under this decree are brought together all the regulations that cover the importing, manufacturing, installing and working of stills. The Law of October 15, 1931 only allowed the operation of stills under the control of the Director General of Excise and the Monopoly. To import a still it is necessary to have a preliminary authorisation from the "Ministerio de Hacienda" and to have the request and the place entered in the Register of the Director General of Excise. When the apparatus is for the distillation of wine, marc or fruit the authorisation for entry is only given after consulting the monopoly. The same applies to transfers, changes or modification of stills already in existence. All stills in the country must be sealed on October 30 except permission to the contrary be given by the Directorate of the A. N. C. A. P. Official authorised by the Monopoly or, in exceptional cases, the Director General of Excise remove the seals if permission to distil were granted before April 30.

In 1938, 222 stills with 300 boilers and a total capacity of about 100,000 litres were working in different zones of the country. These stills were able to produce 6000 litres of alcohol at 60 per cent. every 8 hours. Since 1935 the number has increased by 30 per cent., there were then 173 stills, which shows that the monopoly is advantageous to the producers.

One of the principal aims of the Monopoly is the increased use of wine by-products. In 1934, in round figures, 44,500,000 litres of alcohol reckoned as absolute from marc were purchased against a price of 257,787 \$, in 1937 these purchases exceeded 56,270,000 litres calculated as absolute for 395,150 \$ which shows the interest that the monopoly gives to the development and utilisation of by products. In the course of the years 1933 to 1937 the monopoly spent 1,337,312 \$ on the purchase of alcohol from the vine growers.

In the space of one year from 1936-1937 there was an increase of 17 per cent. in the utilisation of wine by-products. In fact in 1936 the percentage of alcohol manufactures was only 60.36 of the calculated total possible, in 1937 this figure reached 77.30 per cent.

This increase in the utilisation of wine by products was achieved by the monopoly through the persevering work of its Technical and Economic Bureau which has sought

by all the means at its disposal to demonstrate to the producers the advantage of using up all the marc. Further the alcohol is increasingly profitably used. For an example, take 50 per cent. alcohol from marc, in 1934 it was bought by the monopoly at 0.30 \$ per litre and in 1938 at 0.38 \$ per litre, the price varying with the strength of the alcohol. Propaganda and the advantageous price has led to an average increase of strength in alcohols of 16.6 per cent.

The price of marc alcohol is fixed in March and that of alcohol derived from fruit in January. For each class of alcohol three qualities are fixed *very good* (muy buenas) *regular* (regulares) and *bad* (malas), the organoleptic properties to a large extent determining the class. The *very good* quality is encouraged by an augmentation of price which may amount to 5 per cent. according to the decision of the Alcohol Subdirectorate.

On the other hand alcohol of the *regular* grade may have its price lowered by as much as 20 per cent. and the bad qualities are denatured, the price in the last instance being fixed by the Directors of the A. N. C. A. P.

Though the Monopoly has the right of fixing the prices and the qualities the producer is able to appeal against the decisions if they seem unjust or unfavourable, he may demand a second analysis of the samples of his wares kept at the Alcohol Sub directorate and which were sealed and signed by the producer himself. These analyses are made at the Central Laboratory and are passed by the Institute of Chemistry of the Faculty of Medicine.

In many cases the damage observed arises through bad storage conditions and the Administration is conducting a vigorous propaganda for the construction of reservoirs for the preservation of marc in the best conditions. Instructions are circulated on leaflets and, in 1938, in connection with this propaganda, a national competition was organised amongst those who had constructed reservoirs for the preservation of marc before December 15. By these measures it is hoped that the total production of marc will become useable. In these same year, 1938, in zones where there was inadequate still capacity, a service of travelling stills was set up.

The utilisation of by products is now extended to include the extraction of oil from the grape pips and the recovery of cream of tatar from the residues after distillation.

An enquiry was made among the owners of the 222 alembics which were in operation in 1938; they recognised the advantages of the Monopoly to the alcohol industry and the following results of the Law of October 15, 1931 were observed.

(1) An increase in the consumption of grappa due to its better hygienic qualities and, in consequence, an increase in revenue. In fact the latter has trebled between 1931-32 and 1937 without any special propaganda;

(2) The profits of the producers have also been sensibly increased.

(3) The Monopoly has always endeavoured to improve the quality of the liquor by good conservation of the marc and rational and hygienic preparation of the alcohol, reducing in this way the impurities that may be injurious to human beings.

The spirits and, in particular, "grappa" marketed by the Monopoly are not only controlled by the analyses of the laboratories of the Monopoly and the municipalities but samples are also sent for analysis to the best known laboratories of the United States, France and Belgium and also to the National Chemical Bureau of the Argentine Republic.

The consumption of alcohol in Uruguay in 1938 oscillated around 100,000 litres of 50 per cent. spirit; a scheme is being now studied under which the use of alcohol derived from wine to the exclusion of other for increasing the alcohol content of wines and liqueurs is obligatory.

The production of wine alcohol by the Monopoly up till 1938 was derived from the distillation of wine purchased. In 1934, as a result of a crisis of over-production, the Monopoly decided to purchase 6,000,000 litres of wine to be used for distillation and ageing for the preparation of cognac. This quantity was not achieved but the alcohol that was produced was put up in oak casks for conservation.

A new orientation was taken up in 1938 when the Directorate of the A. N. C. A. P. purchased 3,000,000 kg. of grapes for the production of must for immediate distillation; a further 3,000,000 litres of wine from the press was also bought. The grapes mentioned above were bought directly from the cultivators. The purpose of these purchases was the avoidance of the difficulties consequent on over-production and the elimination of inferior wine which is then absorbed by the distillation industry, in this way relieving the market of excessive stocks.

For the first time in 1938 estimation of the glucose content was introduced in the trade. The official price established by the Executive Power was \$ 0.45 per 10 kg of grapes and the average price paid by the Monopoly was \$ 0.4624, the highest price paid to any producer was \$ 0.568 for 10 kg.

This decision of the Monopoly to purchase grapes had both supporters and opponents, but in general the cultivators were favourable, in any case the measures had a favourable result on the 1938 harvest.

Fruit alcohols are only consumed to a limited extent in Uruguay. The legislation in force allows the distillation of fruit musts prepared on the premises and this alcohol is bought by the Monopoly at a price dependent on the alcohol content. If a preference for fruit alcohol is observed on the part of the consumers the sale may reach considerable figures and allow equilibrium to be reached in the event of an overproduction of fruit.

At this point it is necessary to return to the subject of caña, the national drink that is consumed at the rate of about 3,000,000 litres per year. It is made by the fermentation of properly diluted musts with bottoms and pure line strains of selected yeasts which are responsible for the special qualities of the product, bouquet and flavour, and the yield. Fermentation takes place in open vats that have a capacity of 1,500 litres each and have arrangements for automatic temperature control and for the supply of compressed air which helps the first phases of the development of the yeast. There is also equipment provided for the regulation of the temperature of fermentation and for the recuperation of the alcohol. The alcoholic must is then distilled and a liquor with between 60 and 70° G. L. is obtained. For ageing slavonian or limousine oak casks of 4,000 litres are used. According to M. SANARENS of the La Hâvre Municipal Laboratory caña can be compared to a *Fine Armagnac*.

The consumption of industrial alcohol has increased during the space of 5 years between 1933 and 1937 has increased by 32.56 per cent.

The present commercial policy tends to reduce the price of industrial alcohol. Burning alcohol and that used in industry is tax-free and the price which has only to cover the cost of production denaturing etc. is very low indeed. On the other hand the price of rectified alcohol for use in the preparation of drinks and perfumes is raised.

The Monopoly uses the distillery of Capurro for the production of industrial spirit. This distillery has worked since 1888 but was modernised in 1938 and is able to produce 20,000 litres of alcohol rectified to 96° G. L. per day. In 250 days it can satisfy the consumption. It is situated on Montevideo Bay and has 14 Babcock-Wilcox, 160 HP boilers of the 1937 model, 14 Henz boilers with a capacity of 1 ton of cereals per charge, 20 metal vats, Amylo system, of 115,000 litres capacity and 4 fractionating columns and 3 rectifiers as well as an apparatus for the recovery of maize

germ oil, a carbon dioxide liquifying apparatus, plant for filling steel cylinders with the same and a plant for the manufacture of 5 tons of dry ice per day.

Future expansion of alcohol production is the subject of close study and the erection of distilleries in the most appropriate locations is contemplated. These distilleries are in fact effective means of intensifying and improving agriculture, a great problem for the distillation industry in Uruguay being the supply of raw materials. The Monopoly was set up specially to solve the crisis of over production as far as possible and to exploit the products of agriculture economically. The distillation industry in the hands of the state is, therefore, a regulator of agricultural production, it must consume an increasing quantity of those raw materials of which production is in excess of normal consumption and replace them by others when production is poor; that is to say the distillation industry, in order to serve as a regulator, must not use only one raw material but must be able to utilise all and any of the the different national alcoholic products.

Uruguay, with its limited area, its climatic disadvantages and other conditions that lead to great fluctuations in any given crop, will be able, by this interchangeability of raw materials to assure regular work for its distillation industry.

F. L.

BOOK NOTICES *

QUARANTA, F., Ethiopia. An Empire in the making. With a foreword by the Rt Hon. Lord Hailey. London, P. S. King & Son, Ltd., 1939, XX-120 pp., 23 plates, 2 maps.

In reviewing the *African Survey* by Lord Hailey (January number, pp 36-37), it was regretted that no mention was made of Italian East Africa, a colony, which in many respects resembles the other African colonies treated by Lord Hailey. The volume by Baron QUARANTA fills this gap. The A. describes the recent administrative and economic progress made in Ethiopia; Eritrea and Somaliland, the oldest possessions in the Italian Empire are not discussed.

In the first chapter, the principles of administration in I. E. A., native policy, medical and educational services are reviewed. The second chapter deals with native agriculture and the efforts made towards improving the primitive methods of cultivation of the natives. The three climatic zones described are those distinguished by the natives; the soil classification appears rather elementary, but will certainly be brought up-to-date as research work advances. It is strange that the A. does not touch on the important problem of soil erosion and the control measures necessary for successful agricultural colonization. The A. studies the chief food crops and industrial plants cultivated by the natives, coffee being undoubtedly the most important. Brief information is given on animal husbandry, hides being considered the most important product, and on the veterinary services.

The agricultural services discussed in the third chapter were established with a view to improving native methods of agriculture by propaganda and the distribution of selected seeds in order to increase the purchasing power of the native for more Italian goods and to reduce imports of food products by higher yields. The question of improved coffee production is also discussed.

Economic development in recent years, the subject of the fifth chapter, is studied in detail, taking into account the different possibilities of the country. It is evident that white settlement, the ultimate aim of Italy, takes first place. The Association

* Reviews of books presented to the Library appear under this heading.

of Ex-Service men (Opera Nazionale Combattenti, O.N.C.) was the first to give effect to a scheme of colonization. The first colonies, Oletta and Biscioftu, were founded in the immediate neighbourhood of Addis Abeba. In May, 1939, there were 21 houses at Biscioftu and 82 at Oletta, and it is expected to be able to settle 500 families in these two villages. The settlement of share tenants chosen by the Migration and Colonization Board is another system of Italian colonization. Two companies have been formed: one proposes to settle peasant families from Romagna in the Uoghera (Amara Province), and the other families from Apulia in the Uaccio Valley (Harar). The problem of native labour in these centres is approached in different ways. The O.N.C. and the Romagna colony prefer to employ native labourers, while the Apulia colony is against native co-operation, and therefore proposes to limit the area of the individual farms to 60 acres.

Besides this type of colonization, there are other enterprises equipped with capital engaged mainly in animal husbandry and cotton cultivation.

The other chapters of this book deal with questions which do not directly concern agriculture: mining development, communications (road construction has advanced with remarkable speed and has opened up possibilities for the agricultural development of the country), and urban centres.

The book of Baron QUARANTA will be welcomed by all who are interested in the progress made in Italian colonization. The tone of the book is moderate, the A. presents his facts and avoids, as Lord Hailey says in the preface, praising the results obtained. In my opinion, the A. should have added a chapter on the old colonies (Eritrea and Somaliland) and treated scientific research work, in greater detail especially cartography, which is of particular interest.

W. B.

BORGIOI, E., *Zootecnica degli animali domestici agricoli*. Firenze 1939, S. A. G. Barbera XIX-515 pp., 140 fig. Price 30 liras.

This handbook is for the use of students in agriculture and in veterinary science and also stock-breeders. The different problems of animal husbandry are treated: horses, cattle, sheep, pigs, poultry. One chapter deals exclusively with animal health and diseases. The A. gives the results of research work and indicates the different methods of testing yield, with a view to making them generally known in Italy. The book is written in simple style and will also be useful for non-Italian specialists desirous of having some information on Italian breeds. Of considerable interest the information gives on the economic importance and animal husbandry methods employed for each species, also the comparison between stock-breeding as practised in Italy and in other countries.

I. M.

Prof. UGO PAPI, *Segretario generale dell'Istituto, Direttore responsabile.*

MONTHLY BULLETIN

OF

AGRICULTURAL SCIENCE AND PRACTICE

MIXED CULTIVATION OF CEREALS AND LEGUMES FOR GRAIN

Leguminous root nodules excrete into the soil nitrogenous substances which can be assimilated by non-legumes. Experiments have been carried out recently with a view to cultivating cereals in association with legumes (grain); a supplementary production of legumes is obtained without any corresponding reduction in cereal yield.

Nitrogenous excretion of leguminous root nodules.

The beneficial action of leguminous plants is well known, and has long been utilized by alternating legume with non-legume crops. LYON and BIZZEL (1911) and LIPMAN (1912) showed the favourable influence of legumes on cereals and other field crops cultivated in association. VIRTANEN and his collaborators were the first to prove that the root nodules of leguminous plants excreted nitrogenous substances in the media where grown, which could be absorbed by other plants. This excretion consists mainly of amino-acids (87 to 98 per cent. of total nitrogen). Approximately 50 per cent. of the nitrogen excreted is found in the form of aspartic acid, and the remainder, probably, mostly in the form of lysine. The root nodules contain different amino-acids (tryptophane, tyrosine, arginine, etc.) which are not found in the excretion; therefore, excretion is not due to the decomposition of the nodules. Excretion is maximum during the first period of growth.

VIRTANEN and his collaborators obtained excretion in widely differing media such as sand, clay, sandy loam and even kaolin. There is still some uncertainty, however, as to the conditions under which the phenomenon takes place in the field. The extent of excretion also varies considerably according to different factors which are only partly known: bacterial strain, amount of nodules, host plant, medium and its nitrate content. According to P. W. WILSON, the factors which delay the reproductive stage favour the excretion process.

After LIPMAN, different experiments with pot cultures have proved that the excretion can be absorbed by non-legumes as soon as produced. This immediate utilization prevents loss, and, particularly in poor soils, should improve the growth of non-legumes.

VIRTANEN and his collaborators found that barley absorbed 16 to 27 per cent. of the nitrogen excreted and that in extreme cases, the potato received ten times as much nitrogen as the associated legume whose yield was reduced.

In the experiments of DEMIDENKO and TIMOFIEVA, the nitrogen excreted by the nodule bacteria benefited not only the peas but also the oats grown together on the same soil.

ANDREWS and M. GIEGER observed that the combined yield of rye and peas was considerably higher than that of the peas grown alone. The growth of rye with peas increased the average nitrogen content of the peas from 2.39 to 2.74 per cent. The growth of peas with rye increased the nitrogen content from 0.94 to 1.35 per cent. In the experiments of PAPADAKIS, associated crops gave yields 67 to 117 per cent. higher than those of the legumes and non-legumes cultivated separately.

Mixtures of legumes and cereals.

Under natural conditions, legumes are found in association with non-legumes. Grasslands, pasturages and forage mixtures of leguminous and non-leguminous plants show the same association and the same progressive utilization of the nitrogen excreted.

It is more difficult to cultivate cereals with legumes. It is necessary to reconcile the individual requirements of each; to take into consideration, the differences in vegetative cycle, maturity and harvesting; to determine the most suitable combinations and ascertain those which reduce yield; to canalize the vital competition between the species grown as regards water, plant nutrients, air and light, in order to ensure a successful double harvest.

The mixed cultivation of cereals and legumes is already practised in several regions, but the object in view is not that which has just been defined, it is simply an endeavour to obtain greater security in the production of the legume crops. The cultivation of these crops, in fact, is hazardous and uncertain. Therefore, the legumes are frequently grown with a certain proportion of cereals which help to reduce losses through lodging, facilitate harvesting and drying (peas, vetches) or to limit insect attack. Horse beans-oats mixtures, for example, never attain the maximum yields of horse beans alone; on the other hand, by reducing the damage caused by plant lice, this combined cultivation ensures a more secure and stable yield.

Statistics do not always differentiate between pure crops of legumes (grain) and mixed crops of legumes and cereals. The following indications regarding Germany have been taken from the International Yearbook of Agricultural Statistics, 1938-39.

Crops	Area in hectares			Grain yields in 1,000 quintals		
	1936	1937	1938	1936	1937	1938
Horse beans	46,166	54,093	52,074	948	1,059	1,041
Peas	8,947	11,758	13,662	142	186	220
Vetches	23,005	29,867	35,774	362	491	567
Mixed legumes	20,461	23,039	25,108	371	422	459
Total . . .	98,579	118,757	126,618	1,823	2,158	2,287
Mixed cereal and legume crops (grain)	83,164	95,600	87,304	1,608	1,924	1,847

Separate figures are not given for the grain production of cereals and legumes in the mixed crops and there is no indication as to whether production refers to the mixed grain or to that of the legumes only. Probably the latter, as the legumes are the chief crop.

The following are some legume-cereal mixtures utilized in Germany for grain production (per ha.):

Peas: 120 kg.; Cereals (oats): 80 kg.

Peas: 60 kg.; horse beans: 50 kg.; spring vetches: 40 kg.; oats: 50 kg.

Horse beans: 120-220 kg. (according to size of grain); oats: 30-40 kg.

Spring vetches: 120 kg.; spring cereals (oats or barley): 80 kg.

Winter vetches: 30-80 kg.; winter rye: 40-50 kg. or winter wheat: 60-80 kg.

These different formulae have a common character: the legumes predominate, the cereals only being a secondary crop, serving either as a support (peas, vetches) or as a check to the damage caused by aphids (horse beans).

Experiments of Papadakis.

At the Thessaloniki Station, PAPADAKIS carried out experiments from a different aspect. Taking as a basis the research work of VIRTANEN and his collaborators, PAPADAKIS aims to improve cereal yield by the nitrogenous substances excreted by the root nodules of leguminous plants. In a preliminary experiment conducted in 1938, the yields of wheat alone were compared with those of a mixed crop of wheat and lentils.

wheat alone	1,380 ± 63.9 kg.
wheat — lentils	$\left. \begin{array}{l} 1,365 \pm 63.9 \text{ kg.} \\ 455 \text{ kg lentils} \end{array} \right\}$

The wheat yield is practically the same in both cases and in the second a fairly good yield of lentils is shown.

In 1939, the plots used for this trial were again sown with wheat in order to study the after effect of the mixed crop. In two years wheat + wheat gave 2,297 kg. of grain and wheat — lentils + wheat: 2,662 kg. of wheat and 455 kg. of lentils.

The experiments were resumed in 1939 at the Thessaloniki Station and the six substations at Tripolis, Dourout, Larissa, Messara, Ptolemaide and Serrès. Wheat grown alone was sown at the rate of 100 kg. per hectare; for mixed cultivation, 75 kg. of wheat and 75 kg. of one of the following legumes were used: crimson clover, peas, lentil and in one case chickling vetch (*Lathyrus sativus*). The wheat and legume seed were mixed and sown together. Crimson clover and peas did not give good results and do not appear to be suitable for mixed cultivation with wheat; at least with the varieties and proportions used in the experiment.

Wheat cultivated with chickling vetch produced 902 kg. of grain per ha., as against 1022 kg. when grown alone. On the other hand, over 890 kg. of chickling vetch grain and 716 kg. of straw were harvested. Each kg. less of wheat was replaced by 7.4 kg. of vetch and 6 kg. of straw. In the seven trials, wheat gave a lower yield in mixed cultivation than when grown alone; but the total com-

bined yield of grain of the mixed crop was always higher than that of wheat alone; the poorer the soil, the greater the difference.

In the five trials where the soil was poor, the excess yield amounted to an average of 127 per cent. for grain and 92 per cent. for straw. For each kg. less of wheat, 4.6 kg. of lentils and 9.8 kg. of straw were obtained at Thessaloniki, 4.3 and 6.3 kg. at Tripolis; 9.2 and 9.8 kg. at Dourouti 2 3 and 4.2 kg. at Larissa; 2.4 and 4.4 kg. at Messara. At Serrès where the soil is very fertile (wheat alone: 3016 kg.) and alkaline, mixed crops did not give good results. At Ptolemaide, where the soil is fertile (wheat alone: 2654 kg.), but not alkaline, mixed crops gave fairly good results.

Summing up the results, PAPADAKIS concluded that on poor soil, mixed cultivation of cereals and annual legumes is preferable to cereals alone or to a rotation of annual legumes and cereals. Using a suitable legume (lentil for the greater part of Greece), the two crops can be sown and harvested together.

Separation of the grain is effected at the time of threshing by a helicoidal cylinder grader and can be finished off by an ordinary grader. PAPADAKIS is carrying out propaganda work on this mixed cultivation, wheat-lentils, for the poor soils of Greece.

Mixed cultivation of cereals and legumes for grain in Germany.

Before discussing this question, its importance for Germany should be pointed out. With a view to attaining self-sufficiency in food, it was decided to increase the quantities of forage and cattle feed rich in albumin produced on the farm. As the area at present employed for other crops cannot be reduced, supplementary production must be obtained by means of different catch crops. Mixtures of large-seeded legumes sown on stubble fields give very good results as regards total quantity of albumin produced per unit area and stability in yield. The disadvantage of these mixtures is that large quantities of seed, which is expensive, are required. TIEMANN calculated that the seed for a mixture of large-seeded legumes (vetches, field peas, horse beans) cost 98 RM per ha., that is, about 1 RM per quintal of green matter harvested, for the grain only, not counting other expenses.

As this outlay appears too high to many farmers, they turn to other less costly mixtures and crops, which, however, are also less productive and more hazardous. Besides the price, another disadvantage is that the greater part of the seed of these legumes has to be imported from abroad. Importation is difficult and there is a shortage of seed. In order to increase the cultivation of catch crops by means of home produced seed, Germany would have to reserve 200,000 ha. at present under other crops, for seed production. For a total cultivated area of 21,384 million ha. (excluding the Sudeten region), this represents approximately 1 per cent. It is important, therefore, not only that farmers produce all their own seed of large-seeded legumes required, but also that this production will not cause any reduction in area under other crops nor in yield.

The method adopted is one specially devised to meet this problem of mixed cultivation of cereals and legumes, and consists of adding to the cereals sown

at normal density a small quantity of legumes. This «injection» (Einspritzen)—according to the term used—would enable a normal yield of cereals to be obtained together with an additional harvest of legumes (grain) which would only cost the small quantity of seed used, and the labour for sorting and harvesting. This method needs to be carefully studied before being put into practice as regards the type of cereals and legume to be cultivated in association and also the varieties of these types.

Quantities of seed to be employed.

Autumn or spring cereals should be sown at normal rates. The quantity of legume seed depends on the size of the grain (weight of 1000 seed); kind of legume: vetches and peas fasten onto and entangle the cereals and if vegetation is vigorous will cause lodging; type of soil: on poor soil, cereals normally give low yields, and a larger area is left for the legumes. In any case, the proportion of legumes should be such that the cereal yield is neither diminished nor exposed to the danger of lodging; finally there should be no difficulty in drying the harvest.

It should be noted, however, that even in Germany, this “injection” method would not be suitable in every region; according to TIEMANN, it could not be used in the eastern regions, where it would not be advisable to vary too much from the following proportions per ha.: Horse beans: 120-140 kg.; oats: 30 kg. Field peas (Peluschken): 40 kg.; oats: 80 kg.; or field peas: 80 kg.; oats: 60 kg. With less than 60 kg. of oats, there is too much danger of lodging, and with a smaller proportion of peas, in a dry season, these are completely smothered by the oats and production is nil.

For the production of vetches: oats: 80 kg.; vetches: 40 kg. or oats: 40 kg.; vetches: 80 kg. Mixtures with under 40 kg. of vetch, as for example 20 kg. of vetch and 80 kg. of oats, in eastern Germany, even with a wet season, only yield a small crop of vetch, and in a dry season, practically nothing.

Method of “injection”.

WINTER VETCH.

For sand vetch, if possible choose only dry and light soils. Not more than 6-10 kg. of seed should be used in fields where the average yield of rye amounts from 12 to 16 quintals per ha., and 4-6 kg. in those giving a higher yield. Difficulties at time of harvesting are thus avoided and even in an unfavourable year, lodging will not take place. Phospho-potassic fertilizers should be increased and the autumn application of nitrogenous fertilizer reduced by a quarter; spring nitrogenous fertilization is unnecessary owing to the nitrogen absorbed by the roots of the legumes. The yield of sand vetch amounts to 120-200 kg. per ha. Separation by the cylinder grader of the thresher involves some difficulty and has to be completed by means of an ordinary grader. The cost price of the grain may be calculated as follows: seed: 4.5-6 RM per ha.;

sorting: 3-8 RM per ha. The other costs remain unchanged. The grain produced is worth 70 RM per quintal on the farm, provided that selected seed has been used and not an ordinary commercial variety.

In dry regions where chiefly the Pannonian winter vetch (white flower) is cultivated, the quantity of seed to be added to the cereal can be raised to 12 kg. per ha. It is not so vigorous and entangling as the sand vetch and therefore, there is less danger of causing lodging; it also flowers and matures more regularly and the pods do not burst so easily as those of the sand vetch. The Pannonian vetch grows better with wheat than with rye.

WINTER PEAS.

Winter peas are sown with rye or winter wheat at the rate of 8 to 16 kg. per ha. and give an average yield of 200-600 kg. The best yields were obtained with winter peas from the regions with harsh climate of the Black Forest (Wintererbse von der rauhen Alb) and from Hungary. Winter peas will flourish even in poor soils where rye does not succeed. Even in a wet year, the winter peas have completed their vegetative cycle when the cereals are mature and often are already dry. The tendrils break easily and do not cause any difficulty in harvesting. The pods do not open as easily as those of spring peas and separation of the grain by the cylinder grader of the thresher is easily carried out.

Winter peas can be sown in spring with oats or spring wheat; but less seed is required as maturation is late.

K. SCHMIDT cites the example of a small farm cultivating annually 3 ha. of rye and wheat and where for 4 consecutive years in addition to these crops, 12.5 to 15 qtls. of winter pea grain have been produced per annum.

SPRING PEAS.

The quantity of seed to be employed varies from 8 to 20 kg. per ha, taking the weight of 1000 seed (1 kg. of small-seeded forage peas contains over double the number of seed in a kg. of Victoria large peas). Sowing should be fairly thin in order that the plants may be from 1.5 to 2 metres apart. Only on flowering are the peas easily visible; at the time of harvesting, they can no longer be distinguished. The choice of variety, both pea and cereals, is very important. A late pea like the Balzersbach (spätreifende Balzersbacher Futtererbse) cannot be sown with the Petkus early yellow oats. Experience has shown that the early varieties of the Victoria pea are too ripe at the time of harvesting the oats, therefore causing a loss in grain.

The Swedish Hohenheim peas (Hohenheimer schwedische Futtererbse), the Peragis peas (Peragis Futtererbse), the Swalöf butter peas (Swalöfs Buttererbse) and the Hohenheimer Victoria green peas (Hohenheimer Grüne Viktoria) are suitable for sowing with the following varieties of oats: "Yellow Petkus", "Fläminggold" and "White Endresz". The Hohenheimer forage peas (pink flowers) (Hohenheimer rosa blühende Felderbse) can also be used. The Folger peas ("Waldsack", "Lohmann") and others require further study and trial with other varieties of oats.

According to variety, quantity of seed employed, soil and growth conditions, besides the normal crop of oats, 100-600 kg. of peas can be obtained.

The peas (Peragis, Lohmann grüne Folger and Baltersbach) can be sown early in spring at the rate of 12 to 15 kg. in winter wheat and will show a better growth than with oats. The same is true with spring wheat. Yields are higher and separation by the cylinder grader of peas and wheat is easier than that of peas and oats.

SPRING VETCHES.

With the oats varieties indicated above for the spring peas, the following varieties of spring vetches, at the rate of 4 to 12 kg. can be sown: "Sweet Swalöf", "Pörnbach summer vetch", "Weihenstephan summer vetch" and "Werthers Ettersberg". Growth is good and there is no difficulty in harvesting.

HORSE BEANS.

G. SESSOUS and L. PIELEN concluded from their experiments that it is better to cultivate horse beans with spring wheat or eventually with spring rye than with oats. In general, not more than 25 kg. per ha. are sown.

According to SCHMIDT, with the small-seeded varieties ("Waldsack", "Herz Freya Köstlin", "Dr. Franck"), 20 to 32 kg. can be sown in oats, and with the large-seeded varieties ("Lohmann", etc.) up to 48 kg.

The average taken of two experiments showed that with "Dr. Franck" sown at the rate of 40 kg. per ha., besides the normal crop of oats, a yield in horse beans of 520 kg. per ha. was obtained.

ALIMENTARY PEAS.

The Peragis peas with yellow seeds of average size can be used for human consumption. The cultivation of alimentary peas with cereals is often a failure as the varieties used are often too early. The late variety "Schorr Rappoldshofer Viktoria", on the other hand has given good results. It has already been seen that the Hohenheimer Victoria green peas (green seed) and the Swalöf butter peas (yellow seed) can be successfully cultivated with the oats varieties "Yellow Petkus", "Flaminggold" and "White Endresz". The horticultural variety of pea with short straw "Short and Good" of Zeiner (Zeiners Kurz und Gut) sown at the rate of 20 kg. per ha. with spring barley gave an average yield of 360 kg. of grain over a period of two years' experiments. A few other varieties of peas with not too much straw would probably give good results cultivated with summer barley.

The question of sowing alimentary peas in cereal fields has scarcely been touched and is far from being solved. K. SCHMIDT, however, considers that an additional production of millions of quintals of alimentary peas could be obtained in Germany in this manner.

Conclusion.

It is too early to draw any definite conclusions from the data at present available. The experiments of PAPADAKIS are not complete and have not been continued long enough, and the same may be said of the trials carried out in Germany. In any case, in each country, the application of the method discussed in this article will need very careful study, taking into consideration the local conditions of climate and soil, and the crops and varieties grown. This new trend, however, is worth following closely, especially at the present time when many countries are endeavouring to increase their resources of food products for man and animal.

A. HANCK.

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THE FORAGE PROBLEM IN THE UNION OF SOUTH AFRICA

(Continued)

IV. — Veld improvement.

GENERAL PROBLEMS.

The South African farmers fully realise the seriousness of the situation and a strong movement in favour of veld improvement has developed in recent years. Experiments are now being carried out at the different Faculties or Schools of Agriculture in the Union, and, in particular, at Pretoria, Cedara, Potchefstroom, Glen, Bathurst, etc., and also at the experiment stations of Towoomba, Athole, Leeuwkuil, Rietondale, Estcourt, Tabamhlopt. Other experiments are conducted on privately-owned farms by officers of the Department of Agriculture in order to acquaint the farmers of the work of this Department. The Fauresmith Station and the Grootfontein School of Agriculture specialize in the study of the Karroo problems. Besides research work on veld management, these institutions are also engaged in the production of the species most suitable for this region, and seed distribution.

In this article it is proposed to give a general review of the trend followed and the results obtained rather than go into technical details on the experiments effected at each station.

The object of forage research is to find an equilibrium between man, live-stock and stock-feed. The economic demands of the stock-breeder must be met by the income derived from his cattle, but, at the same time, the stock has its own requirements in regard to soil and vegetation. These requirements should be met without reducing the fertility of the soil or forage capacity. In South Africa, the requirements of man and stock are fairly well known, while up to the present, little attention has been given those of plants and the soil. Thus, as already seen, production capacity declined when an increase was indispensable. Increased production may be obtained by two methods. Firstly, a quantitative increase of herbage by suitable treatment, secondly, by employing a more rational utilization of the forage produced. The problem of improvement in pasturage, therefore, is twofold: production and utilization. Research work at the experiment stations of the Union is concentrated on these two aspects of the forage problem.

(a) *Problem of production.*

ROWLAND considers that little is known on the actual production capacity of the veld, that is, the production of nutritive matter per acre and per year. Production may amount to 3 tons of green fodder if the veld is left ungrazed until the flowering period; in a badly managed farm, production may fall to

a ton, and rise to 6 tons by means of suitably arranged rest periods and the application of fertilizers. Little information is available on the effect of different treatments on the quantity and quality of the green forage obtained. The solution of these problems, therefore, will entail a detailed study of the forage capacity of the veld and of the influence of different treatments (manuring, burning, selection of higher yielding species, etc.).

(b) *Problem of utilization.*

The veld produces forage at different well-determined periods of the year. According to ROWLAND, during the vegetative period of the plants, the veld can easily supply 100 lb. of green fodder to the acre per day, while at other periods, production ceases entirely. This makes it extremely difficult for stock-farmers to utilize to the fullest extent the resources of the veld without causing deterioration and at the same time without underfeeding their stock during the periods of low production.

The problems of veld utilization, therefore, like those of production necessitate the study of different systems of veld management, though from a slightly different angle, to ascertain the reaction of the vegetation.

A third series of problems, however, has to be taken into consideration, the restoration of grasslands now denuded. The natural vegetation of the veld has been either entirely destroyed or seriously depleted by the action of atmospheric factors and by man in particular. SAMPSON considers that the reclamation of these areas will be difficult owing to the low moisture content of eroded soil and to its low water retention capacity, and also because the majority of plants which succeed in growing, die off early in spring, often without seeding. It will take years, therefore, before suitable forage species can again be established.

Stock farmers face the dilemma of whether it is possible to accelerate in some way the re-establishment of desirable species, either by mechanical or other methods of increasing the permeability and retention capacity of the soil, or by sowing better forage species.

Briefly, the problem to be solved by South African research workers for the improvement of the natural grasslands of the Union is: to increase the production capacity of the pasturages and to divide periods of production in an as natural and extensive manner as possible; to restore the regions formerly fertile, but now abandoned or seriously depleted by means of suitable treatment and by the natural or artificial establishment of desirable species; lastly, the storage of fodder and grasses to ensure the adequate feeding of stock throughout the year.

In practice the study of this problem involves: (1) research work on the influence of manures on soil fertility, yield in forage and the composition of the grass cover; (2) controlled grazing systems; (3) planting of good forage species and the selection of existing types; (4) improvement in the technique of fodder storage.

The results obtained and expected are briefly reviewed.

THE CHEMICAL COMPOSITION OF FORAGE PLANTS
AND THE INFLUENCE OF FERTILIZERS AND GRAZING SYSTEMS.

(a) *Chemical composition of forage plants.*

Until recently, little importance was attached to the mineral and protein content of forage plants. Research workers, however, have now carried out detailed studies on the question, in particular, Miss HENRICI, TAYLOR, HALL, etc.

It was soon evident to research workers that the forage plants of South Africa are deficient in minerals, especially phosphorus. This deficiency is the cause of various disorders (osteomalacy, pica, etc.) observed in cattle which have been studied by Sir Arnold THEILER. Since white settlement, the low phosphorus content of herbage has become less evident as farmers supply their stock with the necessary nutritive elements.

The forage plants of Bechuanaland and the coastal area of Natal are very deficient in assimilable phosphorus. In some parts, the soil has a high phosphorus content, but the plants are unable to assimilate this phosphorus. Certain plants cannot grow under these conditions and are used as indicators of the soils richest in phosphorus, e.g., *Salsola zeyheri*. In the phosphorus deficient zones, however, some plants have a higher phosphorus content than others; different grasses can absorb from the same soil, in the same locality, different quantities of this mineral. It has often been observed that on soils apparently deficient in assimilable phosphorus, in contrast to the forage plants, bushes and shrubs have a normal phosphorus content. This is because grasses have a superficial root system and therefore cannot reach the phosphorus in the lower layers of the soil. Not all the pasture grasses of South Africa, however, are deficient in phosphorus. POLE EVANS collected samples of *Urochloa* and *Panicum* in the Kalahari which were as rich in minerals, phosphorus in particular, as if they had been grown in Europe. In general, young grass is not deficient in assimilable phosphorus, but does not furnish a sufficient quantity of green matter.

The protein content of forage plants is also very important in animal nutrition. As in the case of phosphorus, the young plants have the highest protein content. This decreases gradually as the season advances, increases again during the second rainy period and then falls rapidly up to the end of the season. The protein content of forage plants varies more from one species to another than that in phosphorus. HENRICI showed that under the same conditions, certain species of finger grass (*Digitaria eriantha* var. *stolonifera*), rooigras (*Themeda triandra*) and kikuyu grass (*Pennisetum clandestinum*) may contain more protein than other grasses. The grasses in eastern Transvaal are very low in protein. In Zoutpansberg, Swaziland and the Orange Free State, on the contrary, the protein content is much higher. In general, the forage plants of the drier areas of the interior have a higher protein content than those of the coastal areas; in very dry regions, however, they are very poor in protein.

TABLE I. — *Distribution of minerals and protein in South African grass pastures.*
(According to M. Henric)

Pasture	Season	P ₂ O ₅	CaO	K ₂ O	Na ₂ O	Cl	Protein
Bechuanaland	Spring	Rich	+ 0.5 %	—	—	—	Rich
	Summer	Poor	+ 0.5 %	—	—	—	Satisfactory
	Winter	Poor	+ 0.5 %	—	—	—	Poor
Alluvial region of Bechuanaland	Spring	Rich	—	—	—	—	—
	Summer	Better than the above	—	—	—	—	—
	Winter	ditto	—	—	—	—	—
Interior of Kalihari	End of summer	Medium to very rich	Poor to very rich	Medium to very rich	Medium to very rich	Poor to very rich	Medium to rich
Malmani Oog	Spring	Very rich	Rich	—	—	—	Good
	Summer	Medium	Rich	—	—	Rich	Medium
	Winter	Poor to medium	Rich	—	—	—	Poor
Eastern Transvaal	Spring	Rich	Poor	Medium	Poor	Medium	Poor to medium
	Summer	Very poor	Poor	Medium	Poor	Rich	Poor
	Winter	Medium	Poor	Rich	Rich	Poor	Poor
Northern Transvaal	Spring	Good to medium	Medium to rich	Good to very rich	Good to very rich	Good	Good
	Summer	Rich	Poor	Medium to rich	Rich	Rich	Poor to good
Ladybrand District	Spring	Rich to medium	Rich to medium	Medium	Rich	Poor to medium	Rich
Fauresmith Veld Reserve (year with sufficient rain).	Summer	Rich	Medium	Poor	Rich	Rich	Rich
	Winter	(Green) good	Medium	Poor to rich	Poor	Medium	Medium to good
	Spring	(Grey) medium	Poor	Medium	Medium	Poor	Poor
Namaqualand (Concordia-Goodhouse area), before rain	Spring	Poor to medium	Poor	Poor to medium	Rich	Rich	Poor
Natal South Coast and Northern Zululand	Winter	Good	Good	Medium	Good	Good	Good
Natal Interior	Summer	Medium	Poor	Medium to poor	Good	Good	Poor
Swaziland, near Mbabane	Winter	Good	Medium	Medium	Good to rich	Rich	Good
Swaziland, near Stegi . . .	Summer	Rich	Poor to good	Rich	Rich	Rich	Rich
Pretoria, Rietondale	Summer	Medium	Poor to good	—	—	Poor to medium	Good
Springbok Flats (poor localities)	Winter	Poor	Poor to medium	Poor	—	Poor	Poor

The majority of the plants in the Union of South Africa are not deficient in calcium. Some species even have a calcium content above normal. Others such as *Chloris gayana*, *Digitaria eriantha*, different species of *Panicum*, *Urochloa* and *Dactyloctenium aegyptiacum* have a fairly high content. Only the pastures on granitic soils are very poor in calcium; in contrast to other minerals, the content in calcium increases as the season advances.

The grasslands of eastern Transvaal, the coastal area near East London, Albany district, certain parts of the Springbok Flats, and near Pretoria are deficient in sodium. The interior of the Kalahari, Namaqualand, northern Transvaal, Swaziland, coastal zone of Natal, southern Zululand and the eastern part of the Orange Free State are fairly rich in this mineral. Some species like *Chloris gayana*, *Digitaria*, *Panicum* and *Urochloa* spp. always show a higher sodium content than others. It may be noted that *Themeda triandra* is always very poor in sodium. In the table reproduced on page 234, Miss HENRICI has summarized the result of her studies on the mineral and protein content of forage species obtained from the principal pasture regions of South Africa.

So far in this article only grass pastures have been discussed. On studying the shrubs and bushes used as forage in the Karroo or karroid areas, it is seen that these plants have a more stable chemical composition throughout the year than grasses. The shrubby plants of the Fauresmith district have a much higher calcium content than the grasses of the same area. Some, but not all, have a high phosphorus content in spring and are always fairly rich in this mineral. *This is why these plants are very useful as a supplementary winter forage. Their content in sodium, potash, chlorine and sulphur is always higher than that of herbaceous plants grown in the same soil.

Chemical analysis, therefore, should be of considerable assistance in determining the nutritive value of forage plants, but it should not be taken as sufficient. In fact, plants often considered as good from their chemical analysis are refused by stock; it follows, therefore, that there are other factors besides the food value of herbage, for example, anatomical structure, digestibility, etc.

From the results of the experiments carried out, it may be concluded that in many parts of the Union, the content of forage plants in minerals (particularly phosphorus) and in protein is low; that this content (except in the case of calcium) decreases as the plants grow old; that it varies from one species to another and that it is more stable in shrubby plants than in grasses.

(b) *Influence of fertilizers on the chemical composition of forage plants and on their distribution.*

Good quality forage plants do not grow well on poor soils; the greater part of South African soils are poor in phosphorus. Agriculturists seeing the good results obtained from the application of phosphatic fertilizers on arable land attempted to extend this practice to the natural grasslands, thinking that phosphates alone were sufficient and that other fertilizers were seldom necessary. But the requirements of grasslands and arable land are very different; on the natural grasslands the green cover always remains uniform and is rarely destroyed; soil fertility, therefore, cannot be maintained or improved by cultural methods

or a rotation system. Consequently, grasslands require not only phosphates, but also nitrogen for good production.

Many research workers, and in particular, HALL and HENRICI have carried out experiments with a view to determining the influence of fertilizers on the yield of pasture grasses and their botanical composition. These experiments have shown that the use of fertilizers can increase the production and improve the botanical composition of natural grasslands. In his experiments, HALL increased the yield of some pastures by 300 per cent. The fertilizers which were most effective were phosphates, nitrogenous and potassic fertilizers and lime, employed separately or together. Potash and lime rendered the forage more palatable for the stock which showed such preference for this forage that it was even feared that consumption was excessive leading to the premature destruction of the grass cover. The nitrogenous fertilizers, used alone, gave the most decided results.

The effect of manures on the chemical and botanical composition of forage plants was also very pronounced. Rational manuring gave an increase of 20 per cent. in crude protein, 50 per cent. in anhydrous phosphorus, 130 per cent. in potash and 47 per cent. in calcium. At the same time an improvement in the grass cover was noticed—a partial or total elimination of denuded areas and low-yielding species; the poorer species became more palatable.

The experiments carried out by Miss HENRICI gave similar results and also proved that the fertilization of grasslands increases the content of forage plants in protein and minerals, and the digestibility of the proteins.

These experiments have clearly shown the advantages of fertilizers, but does the increase in yield obtained always compensate the cost of the fertilizers? In short, should the fertilization of natural grasslands be the rule; is it always profitable? For some years, research workers have been studying this aspect of veld improvement and are agreed that only grasslands containing 18 to 25 per cent. of desirable and productive species should be given fertilizer treatment.

In conclusion, it may be affirmed that fertilizers exert a favourable influence on the yield of natural grasslands and also on the chemical and botanical composition of the grass cover. The use of fertilizers, however, should be restricted to fairly rich grasslands if any substantial benefit is to be obtained.

(c) *Influence of grazing systems on yield and the duration of veld utilization.*

The system of controlled grazing was considered with a view to obtaining a more rational utilization of the existing forage plants, as the creation of new species is often too costly to be profitable. The different grazing systems employed have already been described in the first part of this article, therefore only the influence of these systems on the productive capacity of the herbage will now be discussed. Their chief object is to extend as far as possible the period of veld production by systematic rest periods in order to obtain as much feed as possible without having to use supplementary forage always expensive and not easily available. The use of fertilizers supplements the

action of controlled grazing. The majority of veld forage plants are not readily consumed by stock, being of poor quality and low mineral content. Mineral and nitrogenous fertilizers by stimulating leaf growth, rapidly increase the mineral content and succulence of the herbage, which facilitates grazing and reduces the percentage of plants rejected by stock.

Numerous experiments have been conducted with a view to determining the influence of grazing intensity on the composition of forage plants and on the duration of their utilization. At Cedara, TAYLOR, to obtain artificially a more or less intensive pasture utilization, topped the herbage at varying intervals. These experiments were carried out mainly on *Themeda triandra* var. *Burchelli* and *Paspalum dilatatum* and showed that frequent cuttings (equivalent to intensive pasture utilization), as was to be expected, considerably reduced the yield in dry matter but the improvement in herbage composition more than compensated for this loss.

At the Potgietersrust Farm, ROWLAND and HECTOR have carried out detailed studies on grazing systems and interesting results were obtained. They found that veld deterioration was caused mainly by continuous and uncontrolled grazing; during summer, the summer pasturages on all farms. They considered that deterioration would not be diminished by restricting the number of head kept in each paddock; this decrease would only increase fodder waste in the winter pasturages. It should also be noted that stock are grazed several times in the same summer paddock as long as the herbage continues to grow, while the winter pasturages are only grazed once. Pasturages of relatively reduced area are sufficient for summer feeding, provided that they are divided into paddocks, which will be grazed successively by the stock. The area of winter pasturage, however, should be considerably increased. When the veld attains its maximum carrying capacity especially at the end of summer, the stock can be kept in the poorer zones; therefore, special attention should be given to the control of grazing periods during the summer months and rest periods. The time and duration of these rest periods are of primary importance. If the veld is left ungrazed throughout the growing period, the plants become overgrown and unpalatable and lose most of their nutritive value; on the other hand, this long rest period favours grass cover maintenance. If the veld is rested during the first half of the vegetative period and grazed during the second, the herbage will not be consumed uniformly. Stock will tend to graze the most palatable plants (*Digitaria*, *Pennisetum*, *Themeda*, etc.), and will reject others which have become coarse or have seeded. Therefore, there will be a gradual increase of the latter in proportion to the former. If, on the contrary, the pasturages are grazed during the first half of the vegetative period, the result is quite different. At the beginning of spring, plants such as *Elyodurus*, *Hetropogon* and *Cynodon* spp. are consumed, and later when all the plants are fully-grown, the stock no longer show a preference for a particular species, and there will be no danger of a harmful alteration in the botanical composition of the grass cover. During the rest period, the plants can easily complete their vegetative cycle and renew their reserves so that new growth in spring will be rapid and vigorous. This system has the advantage of eliminating the

poorer species (*Elyodurus*, *Heteropogon*) which are consumed immediately by the live-stock.

These results clearly show that the best period to rest the veld is during the final vegetative period. In practice, stock farmers should have their grazing lands sufficiently extensive to carry the entire herd throughout the year; these areas should be divided into two paddocks, one being four times the size of the other. The smaller paddock will enclose the best part of the veld. The larger paddock will be utilized in winter and at the beginning of spring; the smaller from January or February up to the end of the growth period. At the beginning of the dry winter period, the large paddock left untouched since the second half of summer, can be grazed under the best possible conditions. A few stock can be left in this paddock in spring in order to make full use of the early plants and those which can only be consumed in the early stages of growth. The possible danger of too intensive an early grazing, therefore, is reduced as the stock are spread over a large area.

In January or February, the herds are shifted to the other paddock which has been rested since the previous autumn. The animals here find ample feed during the second part of summer. During this period, the fairly regular rains enable the forage plants of the other paddock to renew their food reserves so that they will be in the best condition to resist the winter drought and show a vigorous growth in spring.

The system advocated by ROWLAND and HECTOR, therefore, has the advantage of letting the stock consume the plants when most palatable; alteration in the herbaceous cover is avoided and suitable winter grazing is possible. In this way, the double aim is attained: good quality forage and an extension in the duration of veld utilization.

John FISCHER from his experiments at Cedara considers that the paddock system should be adopted. Each camp or paddock should be grazed for 4 to 6 days and then rested for 16 or 24 days. The relative duration of these periods will naturally vary according to climatic conditions. With this system, the stock consume fresh, young herbage having a high nutritive value; all species are grazed and there is no danger of a subsequent modification in the botanical composition of the herbaceous cover. FISCHER, however, advises against premature pasture utilization in spring and considers that the camps should be grazed first by prize stock.

The systems of ROWLAND and FISCHER, although differing slightly in practice, respond to the same necessity and give the same result. Both enable the herbage to be utilized when its nutritive value is highest, eliminate poor forage species, stimulate renewed growth by means of systematic rest periods and extend the grazing period by a rational consumption of the plants.

CONCLUSIONS.

The data available show that the carrying capacity of the veld can be increased considerably and that it may be possible gradually to obtain an adequate forage production throughout the year. But it is evident that despite

the advantages obtained through veld improvement and the use of fertilizers in suitable areas, there will not be sufficient stock feed during the whole year. In other words, the period of veld production can be extended but not sufficiently to ensure an adequate and continuous source of feed. It is necessary, therefore, to obtain supplementary feed during periods of scarcity, and for this reason, selection work is carried out on high-yielding species, artificial pasturages are established and different methods of fodder storage are studied.

(To be continued).

J. LEGROS

NEW METHODS OF HAYMAKING

A suction conveyor is used, first to accelerate the drying of the grass mown and cut in the field, turning it behind the mower, then to load the hay on the trucks and lastly to transport it to the loft. The herbage can be mown and the hay stored the same day.

General.

Obtaining and keeping fodder for the maintenance of cattle has always involved much work and considerable difficulty. Insufficient labour is the main difficulty at haymaking time and consequently the fodder cannot be cut early enough and harvested whilst conditions are still favourable.

The earlier the mowing takes place, the greater the value of the fodder, even if the quantity be less; the quicker and more uniformly the material is dried the better the conservation of the nutrient elements in the hay, but, whilst the time of mowing may to a certain extent be fixed at the most opportune moment the rapidity with which the hay is made by the traditional methods still depends on the weather.

Losses during haymaking.

Therefore with a view to avoiding losses due to adverse weather conditions, attempts have been made recently to dry fodder artificially; as regards quality, excellent results have been obtained. However, from an economic point of view, except in a few cases, this process is not profitable on account of the high costs involved in furnishing and maintaining the necessary equipment and as a result the tendency towards artificial drying has somewhat diminished recently.

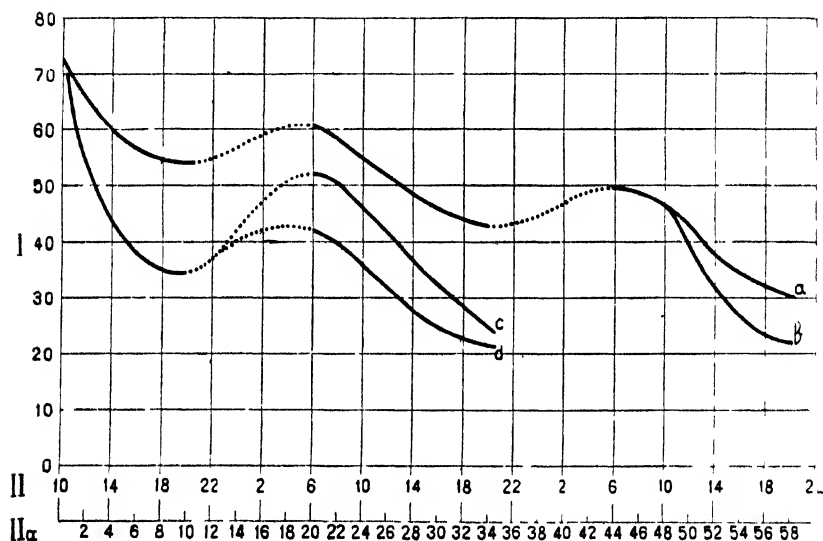
In general, the substitution of ensilage for natural drying has only become of importance where it is impossible to dry and store fodder satisfactorily. Ensilage is thus useful in supplementing natural drying methods; its advantages and disadvantages cannot be discussed at length here and it can only be said

that all artificial methods of fodder conservation are more costly than haymaking and are not very much more economical as regards the labour involved and are, generally speaking, only of limited importance in comparison with the latter.

It is for this reason that recently attempts have been made to use technical aids in ordinary haymaking to an even greater extent thereby economizing labour and conserving more of the nutrients contained in the herbage.

FIG. 1. — *The rate of drying with various field methods.*

(According to CASHMORE)



I — Moisture content per cent.

II. — Time.

IIa — Hours after cutting.

Curve a — Cut and left untouched in the swath until dry enough to carry.

Curve b. — Cut and left untouched for 2 days and then tedded.

Curve c — Cut, tedded immediately, and tedded again after 24 hours.

Curve d. — As c, but put up in windrows overnight and re-tedded about 10 a. m.

The quality of the fodder may be lowered by losses arising from the following phenomena:

(1) *Before mowing*: standing too long in the field (young grass before flowering having the highest nutritive value).

(2) *After mowing and during haymaking*: principally by respiration and bleaching, but also by over-drying, and finally, in the case of leguminous plants, by the shattering of the leaves richest in nutrients.

(3) *After stacking*: by spontaneous development of too much heat during storage of the hay.

Against these losses, it must be borne in mind that the losses arising before mowing and depending on the period at which it takes place can more or less be avoided, and that the losses arising during drying in the field depend primarily on meteorological conditions, but also, in part on the method of drying.

Investigations on drying, carried out under different meteorological conditions, but all following the same method have established the following facts: (a) wet weather causes considerable losses both by respiration and washing out as in these conditions drying is retarded; (b) too drastic insolation may also be very injurious by causing over-drying of the soft parts of the leaves; (c) more or less windy and cloudy weather is ideal for haymaking.

Investigations on drying under the *same conditions* but using *different methods* have shown that, during the day, drying may be greatly accelerated by tedding the hay frequently, whereas during the night, moisture is taken up by the herbage, and it is necessary, to prevent this as far as possible by putting it in windrows or swathes before nightfall. In comparison with the system in which the grass remains spread out on the field from the time of cutting until completely dry, the method of tedding the hay as soon as it is cut and gathering it into swathes before nightfall and re-tedding it the following morning allows a reduction of 24 hours in the time necessary for drying, *i. e.*, the time is reduced from 3 to 2 days while the quality of the hay is improved.

Losses after stacking are usually due to insufficient and uneven drying. Parts of the stacked hay are moist and with poor aeration generate heat, resulting in spoiling and even fires.

New and rapid methods of haymaking.

Attempts have been made recently to use technical methods as far as possible in connection with haymaking, in this way obtaining a more rapid and uniform drying and economizing in labour. Up to the present, practical trials have been made chiefly in the United States. Some years ago, a Californian farmer who never succeeded in obtaining a good alfalfa hay (the leaves dried before the stems and crumbled) devised a machine for uniform drying; this consisted of two rollers revolving inversely which seized the lucerne, as soon as mown, behind the cutting bar of the mower; under the heavy pressure of the rollers, the stems were broken and split and thus could be dried in the same time as the leaves. By this means, drying was not only more uniform and rapid, but the forage obtained had a higher nutritive value.

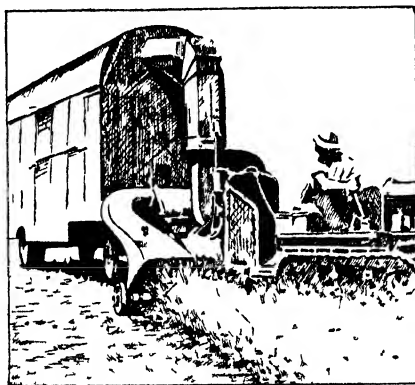
Some methods of artificial drying attain the same object by chopping the more or less thick stems, breaking open the cellular tissue. It was suggested recently in Germany that this principle could be applied in natural drying by placing a chopper just behind the cutting bar of the mower; in this way the finely cut herbage dries more rapidly.

With the present type of harvesting machines, it would be impossible to house this chopped hay when dried, as even now, it is very difficult to load cut short hay from young grass with ordinary hayloaders as the hay easily slips through the sweep rakes of the machines and remains on the field.

This difficulty has been overcome by means of a vacuum loader recently invented in California and specially constructed for collecting short hay. This machine acts more or less on the principle of the vacuum cleaner; the mouthpiece moves along the ground with a pick-up attachment to facilitate suction. The dust bag of the ordinary vacuum cleaner is represented by the closed truck which holds the chopped hay sucked in by the mouthpiece.

With this type of vacuum loader, the mown and chopped hay, dried on the field, can be collected in a covered truck, and taken direct to the hay-loft

FIG. 2. — *American Vacuum Hayloader used in California.*



by means of a pneumatic conveyer. Drying on the field can be still more rapid if a suction conveyer for turning over the chopped herbage is attached to the back of the mower and chopper. The grass cut by the chopper at the back of the mower is too short to be picked up by ordinary tedders, therefore, the grass should be turned by means of a suction conveyer, left open at the back, and not attached to a loader, in this way, the chopped forage in drying is whirled into the air and then falls on the ground.

However, this method cannot be employed if there is a fair amount of wind, because as the grass became drier it would be blown away. Taking this difficulty into account, it was recently suggested to use small driers for the final drying; these can be operated much cheaper than the present type of drier as the forage is chopped and already fairly dry.

It has been claimed that a short preliminary natural drying reduces the carotene content of the fodder, but this has still to be proved; in any case, it is improbable that *rapid* natural drying causes any significant loss.

If the practical results of recent changes in haymaking methods are compared with the systems employed up to the present (mechanical mowing – turning by means of various implements – swathing with a swath turner, sweeping, loading, storing, unloading in an air-blast chaff cutter), considered, however, as being an improvement on former systems, it must be admitted that with res-

pect to this expenditure in labour, time and machinery, the recent changes made should lead to more simple and rapid methods of haymaking and improved quality.

In summing up, therefore, it is a matter of (1) attaching a chopper to the mower, and, eventually a roller press; (2) constructing a multiple-use implement which can be used when required as a suction conveyer, vacuum loader and as a pneumatic conveyer for unloading; (3) using two closed trucks; to improve and simplify haymaking methods effectively enough to eliminate the use of the implements and machinery at present adopted.

H. J. HOFFEN.

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MISCELLANEOUS INFORMATION

Alternate and spring wheats in Belgium.

The Research Station for plant improvement at Gembloux has been carrying out experiments since 1935 with a view to determining the value of the many winter wheat varieties of Belgium for sowing in February-March. These experiments showed that, in order to avoid a decrease in yield and quality of the grain, alternate varieties should not be used too near their sowing limit. The following table summarizes the sowing limits and the properties of the races cultivated in Belgium as according to C. JOURNÉE and E. LAROSE.

Varieties	Resistance to			Observations
	lodging	yellow rust	smut	
(A) Sowing limit about February 15-20 <i>Jubilee Hybrid</i>	very good	very good	refractory	Wheat requiring good soil
<i>Professeur Delos</i> (O strain)	fairly good	very good	refractory	idem
(B) Sowing limit towards the end of February: <i>Vilmorin 23</i>	poor	poor	refractory	Suitable for medium soils
<i>Côte d'Or</i>	good	good	susceptible	
<i>Vilmorin 27</i>	fairly good	good	very susceptible	
<i>Prince Leopold</i>	idem	susceptible	susceptible	
<i>Gembloux Institute 18-102</i>	idem	idem	idem	idem

Varieties	Resistance to			Observations
	lodging	yellow rust	smut	
(C) Sowing limit towards March 8-10: <i>Jonquons Hybrid</i> <i>Watines Early</i>	very good poor	poor good	refractory susceptible	For heavy, fertile soils Susceptible to rot. Suitable for medium soils
<i>Benoit 40</i>	medium	poor	idem	
(D) Sowing limit about March 15: <i>D. D. Tourneur</i> <i>Chanteclair</i> <i>Bon Moulin</i>	poor idem idem	good idem poor	good idem very susceptible	
<i>Picardv</i>	good	appears good	appears good	New variety recently introduced into Belgium Suitable for medium soils
<i>Vilmorin 29</i>	fairly poor	fairly good	good	
(E) Sowing limit towards the end of March: <i>Gembloux strain 61</i> . .	very good	good	slightly susceptible	Short straw, good tillering

In 1939, comparative trials were conducted on the behaviour and yield of the principal varieties of alternate and spring wheats. It was found that for sowing up to the end of February, good quality alternate wheats rather than the best spring wheats known at present should be used, taking into consideration their yield and resistance to lodging and yellow rust.

During the first fortnight of March, alternate wheats such as Gembloux strain 61, can be successfully used in preference to the best spring wheats.

A. H.

Colza and winter rape in Germany.

To meet her requirements in fats, Germany is endeavouring to increase the cultivation of oil-yielding plants, colza and winter rape in particular. But this increase is not easy to attain, as growers have little practical experience of these crops and have to be taught the necessary technical requirements. On the other hand, it is considered that these crops give uncertain yields and little profit.

With a view to determining the possibilities of extending the cultivation of colza and winter rape, Berthold LAGAVE studied the yields in different regions, chiefly in Prussia, as compared with other crops and according to type of soil. He particularly noted that yield per hectare decreased with the quality of the soil but more slowly for colza and winter rape than for cereals. Taking into consideration the value of the products, however, it is not in the best soils that these oil-yielding plants give the highest relative value, but in medium soils easily tilled, where the yields of all other crops, with the exception of potatoes, would rapidly decline. Therefore, relative and not absolute yields count, chiefly as compared with wheat.

Colza could be cultivated on relatively poor soils which were often considered unsuitable, as the absolute yields were fairly low. In good soils, however, the oil-yielding plants cannot always compete with other crops. Heavy soils and also very light and shallow soils should be avoided.

The drier the climate, the less the relative value of the oil-yielding plants. This value rises with increasing moisture and increasing humidity of the air, but only up to a certain point, after which, cultivation is difficult and the crop may even be spoilt. Average humidity gives the best yield.

When the vegetative period is fairly long, colza can largely replace winter rape, which gives appreciably lower yields. Winter rape does not appear to be less exacting than colza as regards soil requirements; therefore, length of growth period rather than soil requirements should determine choice of crop.

The prices on which Berthold LAGAVE based his study are 32 RM per quintal for colza and winter rape, 19.35 RM for wheat, 17.90 RM for rye, 16.10 RM for winter barley, 18 RM for spring barley and 14.85 for oats.

The prices obtained for colza and winter rape are adequate when growth conditions are favourable; but, if cultivation is to be extended to less suitable areas, the price will have to be increased in order to compensate for the reduced yield.

It is on the large farms growing mostly cereals that the cultivation of oil-yielding plants could be extended. Oats are the best indicated to be replaced by colza, but on no account, potatoes

On small farms with a large proportion of livestock and where a large amount of straw is used, in regions with meadowland predominating, and on farms where cultivation is intensive, specializing in root or industrial crops, cultivation of oil-yielding plants would be very limited.

If the cultivation of colza and winter rape is to be augmented the question must be studied according to each agricultural region and demonstration fields established in order to show the farmers the agricultural and economic value of these crops and supply them with the necessary technical information

The area under colza and winter rape in 1939-40 increased to 200,000 hectares and an endeavour will be made to increase this area still further in 1940-41. To this end, cultivation is organized on a contract basis and a prize of 4 RM per quintal of seed over above the 40 RM per 100 kg. is offered. It is understood that this is the price for sound and clean seed, delivered at the nearest railway station. The moisture content of the seeds should not exceed 12 per cent.; a proportional increase or reduction in price is made according to a higher or lower moisture content. Producers are also allowed a preemption of the purchase of the seed-cake at the rate of 50 per cent. of the quantity of seed delivered.

A. H

Capsicum cultivation and industry in Spain.

Peppers are cultivated on a more or less large scale in nearly all the provinces of Spain either for direct consumption or for pickling. This crop covers 15,000 hectares and gives a yield of 2.4 million qls. per annum, representing a value of 90 million pesetas. Some varieties are also cultivated for the preparation of 'pimentón' (powdered or ground red pepper); these capsicums are grown on irrigated land (6,000 ha.) and are only found in four provinces. 'Pimentón' is an important industry and the following will be of interest.

'Pimentón' is a red powder obtained by drying and crushing certain varieties of capsicum, rich in colouring matter. The industry is already well established, dating

from the beginning of the last century. Of the 6,000 hectares under cultivation, 3,000 are in the Province of Murcia, 1,590 in the Province of Alicante, 1,350 in the Province of Caceres, and 60 in the Balearic Islands. The average production amounts to 160,000 qls. of dried peppers, of which about half, representing a value of 15 million gold pesetas, is exported chiefly to the United States (35 per cent. of the total exports), to Argentina (23 per cent.), the countries of Central Europe (15 per cent.), Portugal (5 per cent.), Algeria (8 per cent.), Italy (6 per cent.), Germany (3 per cent.), etc.

In the provinces of Murcia (Segura Valley) and Alicante, only one variety of *Capsicum annum* L., 'nora', is cultivated. This variety is characterized by the practically spherical form of the fruit, hence the popular name 'ball'. The fruit is from 4 to 5 cm. in diameter and acquires a special aromatic flavour after drying; the pulp is bright red in colour and sweet or piquant in taste. The fruit is dried when ripe, usually in the sun. When harvested, the peppers are spread out on wicker trays exposed to the sun; the second day, they are cut in two and drying is continued; after five days, the peppers are ready for crushing. Artificial drying in ovens, at temperatures not exceeding 55° C., is now being carried out on a large scale. The final product is redder in colour.

Harvesting begins at the end of August or the beginning of September; there are usually three crops corresponding to the three flowering seasons. The yield varies from 25 to 40 qls. of pericarps per hectare; 4 kg. of green peppers give 1 kg. of 'pimentón'.

Special mills with two cylindrical stones, one fixed and the other revolving, are used for crushing.

A Royal Decree of February, 14, 1938 authorized the manufacture of two qualities of 'pimentón': (1) 'pimentón' dry milled, and (2) 'pimentón acetado'; the first is obtained solely from the dried and powdered fruit of the red pepper, for the second, before crushing, olive oil in the proportion of a maximum of 10 per cent. of the weight of the dried peppers is added.

The 'pimentón' produced is graded into 15 to 20 qualities. The first six grades are ground pericarp only, the others are mixtures of pericarp, seeds and stems. The 1st, 2nd and 3rd grades are obtained from fruits of the first crop of the year.

A. P

Development of fruit arboriculture in Bulgaria.

Considerable advance has been made in fruit arboriculture during the last ten years. Up to 1930, fruit production was of little importance, being limited to about 10,000 hectares planted chiefly with plums. Since 1930, the area planted has increased, and during the period 1930-39, amounted to an average of 4,000 hectares per annum. Half the production is composed of plums, and the remainder of apples, pears, peaches, apricots, etc. The principal centres of production are at Kustendil, Troyan, Drenovo, Tetevene, etc. In the region of Troyan alone, the sale of plums and prunes has yielded an income of over 100 million levas. A similar amount was obtained at Kustendil from apple production. The Bulgarian Government, through the intermediary of its technical Services, assists very effectively in the improvement of this production. The first State nursery was established in 1898; within the last ten years, the number of these nurseries has increased rapidly, and at present total 30 producing an average of 300,000 selected plants per year. During the last three years, several up-to-date establishments have been built for the industrialization of part of the fruit produced. This industry is becoming an increasingly important factor in the economy of the country.

A. P.

Progress and encouragement of animal husbandry in Belgium.

The report of the Animal Husbandry Service of the Belgian Ministry of Agriculture on its activities during the year 1938, published recently in the "Bulletin du Ministère de l'Agriculture" (Brussels, 1939), gives an interesting review of the different tendencies followed in stock breeding in this country.

In regard to the improvement of horses, the Service has endeavoured to apply methodically the regulation of April 6, 1936. As the chief means of improving the different types of Belgian horses, the Service advocates the licensing of breeding animals and the organization of competitions with a view to selecting the best types. For the breeding of draught horses, the regulation of 1936 divides the country into three zones according to type of soils, as the size of service stallions varies in proportion to the fertility of the soil. The licensing of stallions for a certain zone holds good for the whole area of this zone. The stallion has to be presented each year before a jury consisting of two commissions. The first is comprised of three veterinary surgeons, and their main object is to identify the animals and detect any means used to disguise any defects and also to inform the jury about certain congenital anomalies which make judging difficult. The second commission composed of two stock-farmers and one veterinary surgeon is authorized to draw up the list of stallions licensed for public service, and also to distribute prizes in horse shows.

Licensing of mares is not yet organized in Belgium; competitions only being held. As a result of an agreement between the Department of Agriculture and the Ministry of National Defence, prize mares will be excluded from the list of requisitionable horses for a year. In this way, it will be possible to maintain in the country, in case of mobilization, some prize animals and thus keep a nucleus of stock sufficient to preserve the qualities of the breed.

For thoroughbred horses, licensing of stallions is carried out each year by the Belgian Jockey Club, while the licensing of half-bred horses is organized by the Association for the encouragement of the breeding of army horses, which also registers genealogical data and organizes the annual national shows.

For the improvement of cattle, the following measures have recently been taken (1) modifications in the estimating of individual production in milk control; (2) standardization of the coats of the cattle breeds of Belgium; (3) organization of provincial and national cattle shows; (4) application of artificial insemination.

Modifications in the estimation of individual production were necessary owing to foot and mouth disease. Normally the control of milk production should be carried out once a month during a lactation period of 300 days. Because of foot and mouth disease, many of these check-ups had to be stopped. To continue this situation would have been unfair, if only because the progeny of the cows which had not had complete inspection, would be considered as the progeny of untested cows. With a view to remedying this disadvantage, the Service has decided that although milk control must be interrupted owing to disease, during the seventh month or one of the following months, the federations are to calculate the average decrease in milk production from the third month up to the last month, inclusive, of milk control. This average should be multiplied by the coefficient 1.5 and the result subtracted for each month during which there was no control. As regards fat percentage, the average increase from the third month up to the last month inclusive should be calculated. This average should be added for each month not controlled.

In regard to standardization of coats, it may be recalled that since the systematic organization for the improvement of cattle breeds in 1919, a breed with a character-

istic and definitely marked coat has been indicated for each region: uniform red for eastern Flanders, red-piebald for Campine, black-piebald for the Pays de Herve, and blue for the remainder of the country. It will soon be seen, however, that despite the efforts to maintain the red-piebald breed of eastern Flanders and the blue breed of middle and upper Belgium, the white coat breed is increasing year by year. Following a thorough technical study of the question, it has been decided to endeavour to obtain a uniform white breed for the two breeds.

The organization of provincial and national cattle shows has also engaged the attention of the Service. An endeavour has been made to regulate these shows by holding alternately a provincial show and a national show to be repeated every two years. In this way, an attempt was made to remedy the situation which formerly existed when comitia and private associations organized competitions or shows anywhere in the country without any system, leading to confusion and inadequate results. The new regulation was promulgated by Royal Decree of February 16, 1938.

The application of artificial insemination in stock breeding has also been studied. The provincial Federation of the Stock-breeding Associations of western Flanders, in 1938, made a first attempt to improve certain qualities in the stock: for example, good hindquarters and high fat content of the milk, wanting in some types. As a result of the satisfactory result of this experiment, the Department of Agriculture encouraged further experiments with the object of obtaining as much theoretical and practical data possible with a view to the eventual general use of this method in regions where good bulls are scarce, and also of bringing about the absorptive cross-breeding of the black-piebald cattle in the north of eastern Flanders.

The results of this experiment showed that (1) artificial insemination carefully carried out gives a higher percentage than the natural method; (2) it is an excellent means of overcoming sterility caused by granulous vaginitis; (3) the initial costs amount to about 1600 francs and the working costs about 200 francs per day; (4) the maximum number of cows which can be treated by one operator total about 20 per day.

The Animal Husbandry Service is endeavouring to produce as economically as possible pigs which meet market requirements. The following measures are employed (1) very strict selection of the two breeds, Grand Yorkshire and "Indigène Améliorée", organized according to the principles on which other breeds of domestic stock are based; (2) general application of the system of selling according to quality.

In regard to the improvement of goats and sheep, an attempt is being made to improve the breeding of milch goats and ewes. Up to 1938, little interest was taken by the Department in sheep farming, sheep being of very limited importance. In consequence of their rising economic importance, the Service held an inquiry and the following breeds are being taken into consideration: Suffolk, Campine breed and the Entre-Sambre-et-Meuse breed.

In regard to aviculture, mention should be made of the national egg production competition, the establishment of breeding stations, the organization of national shows and international exhibitions, shows for the conservation of Mechlin cocks and cockerels with plain combs and finally the practical organization of the control of *Bacterium pullorum*.

The Animal Husbandry Service each year submits to different research institutes problems of immediate practical importance. During 1938-39, the following questions were raised: (1) Is the artificial insemination of cattle practicable in Belgium? (2) Which are the most suitable breeds of sheep for Belgium? (3) The causes and form taken of variations in fat content of milk.

The use of horses and the mechanization of agriculture in Germany.

As a result of present circumstances, Germany has had to requisition a certain number of horses for her army, which, during the first months of the war, caused a reduction in the number of draught horses available. To remedy this shortage, cattle were used as much as possible and the horses left were utilized on neighbouring farms where the want of tensile force was most acute. Prices are higher on the horse market. In order to prevent further increase in prices and to distribute the available draught horses in an adequate manner, the Minister of Agriculture has issued orders regulating the sale and purchase of horses. According to the *Frankfurter Zeitung*, February 24, 1940, these regulations prescribe that in future, the sale of horses will be authorized only on the presentation of a 'horse permit' and an attestation from the authorities on the necessity of purchase. In this way, it is hoped to prevent excessive increases in price and to organize the distribution of the horses according to the requirements of the country. The new regulations, naturally, do not alter the obligation of the farmers to lend their teams to neighbouring farms, if the latter have insufficient means at their disposal.

The improvement thus obtained in the utilization of farm teams is all the more important in that the shortage of horses cannot be covered by machinery. Although the number of agricultural machines used this year is greater than that of the previous year, the limits set by the fixed amounts of petrol and iron to be used cannot be exceeded. An endeavour is being made to increase the number of machines employed in small and medium farms, which as regards mechanization are not as far advanced as the large farms.

The collective utilization of machines is also advocated. But more important than an increase in the number of agricultural machines, is the supplying of spare parts and repairs service which are to be re-organized on a new basis.

I. M.

Development of agricultural instruction in Hungary.

One of the principle functions of agricultural instruction consists in the dissemination of technical knowledge among small farmers. The greatest obstacle to this scheme is the difficulty in finding a type of school which while giving a good basic instruction, does not take the young people of 15 to 18 years away from their work on the farm. For the last fifteen years, an endeavour has been made in Hungary to overcome this difficulty by establishing winter schools, which are open from November to March only. At the end of the course, the students take part in a farming competition and an examination is held on the results of their work. If the students pass they obtain a special badge. In 1937-38, there were 15 schools of this type in Hungary; instruction was given by 76 assistant lecturers assisted by 17 teachers, and 1122 students obtained the special badge. In 1939-40, the number of schools increased to 28, and an increasing interest is being taken in their development with a view to organizing them on a more systematic basis.

I. M.

BOOK NOTICES *

WRIGHT, C. H. *Soil Analysis*. A handbook of physical and chemical methods, Second Edition 1939 London. Thomas Murby and Co. 267 pp., tables and figures in text, Price 16s.

[The previous edition of this book appeared 1937 and was greatly appreciated by all who were concerned with the analysis of soil. The difficulties of the soil chemist are not understood by an academic analyst, to whom the former's work may seem ludicrously crude at some stages, finical at others, always arbitrary and often illogical it is of course the nature of the medium and the relative importance of the determinations, as well as the degree of accuracy that is obtainable, that have given its peculiar character to soil analysis and to the critic who comments adversely on the methods proposed by WRIGHT there is always the retort available that they are the best available at present.

It is the recognition of this last condition and the judgment used in adopting unproved methods that are the hall marks of both a good soil analyst and of a good text book and the present book is admirable judged from this standpoint; to one familiar with the difficulties of this work, it shows a desirable balance of conservatism and progress together with a not unquestioning submission to authority that is essential to the maintenance of uniformity in a subject that is, of necessity, rather arbitrary. The admission of the disadvantages of the international methods of mechanical analysis given immediately before their detailed description is an instance of this desirable attitude on the part of the writer.

Perhaps undue caution or perhaps a desire to avoid embarking on a theoretical discussion has relegated the determination of the capillary potential (pF value) to a few lines and one reference and the omission of biological methods for available plant nutrients seems to be a serious lacuna. On the other hand, the treatment of physical methods for determining pH are fairly criticised and adequately described.

The book is intended as a laboratory manual, neither more or less, and it will be of great value in this capacity; at the same time numerous references to original literature are given in the text and will enable critical workers to search for further information but the author's cautiousness in discarding old and well tried methods for routine work is worthy of imitation. The book has, naturally, not the same measure of authority as "Methods of Analysis" of the Association of Official Agricultural Chemists nor as the proposals of the International Soil Science Congress yet the popularity that it enjoys and the frequent reproduction of the methods advocated by the above mentioned and other authorities will help a great deal in arriving at the uniformity that is so desirable in soil analysis].

J. C. H.

DEL PELO PARDI, G., *Gli attrezzi rurali ed il lavoro agricolo nell'antichità*. Roma, 1940, 79 pp., ill.

[This publication on the agricultural implements and farming methods used in ancient times deals chiefly with the Roman period, and is based on the writings of Varro, Columella, Palladius, Virgil, Pliny and others. The A. reviews the linguistic and historical analogy between the implements employed at that period and those in use to-day in Italy, and particularly in regard to the working and tilling of the soil and also to harvesting.

The A. discusses in detail the origin of the plough in prehistoric times and its development in the Roman period. According to the A., the description of the plough by Virgil is not quite clear on certain points. For example, it is not certain as to which parts the "binae aures" refer, as it cannot be a double ploughshare that is meant. The A. thinks they may be mouldboards on the two sides of the plough.

* Under this heading are included short synopses of books received for review.

It appears more probable that these "binae aures" were two lateral boards worked by foot and used to facilitate the direction and the regulating of the depth of the swing plough. Even now, in other implements which date from this period and even earlier, such pedal boards are frequently found, for example, on shovels. Could not this system also have been used on swing ploughs and later abandoned?

The Roman already knew the importance of the upkeep and maintenance of agricultural implements. Thus Varro writes that implements and ploughs should not be left out in the open, but always kept under cover, not so much as to prevent theft, but to protect them from adverse climatic conditions, as constant exposure would render the implements useless.

As a rule the Romans attached the greatest importance to the upkeep and utilization of agricultural implements. Order in the general organization of an agricultural enterprise is compared by Columella to the ordered harmony in music. Disorder is just as tiring as order, he writes further on.

In conclusion, the A. describes briefly the working conditions of a Roman farm and is opposed to the erroneous conception of later periods which considered them servile. He points out that, on the contrary, the servants were considered as belonging to the family and treated accordingly. The authority of the head of the family was naturally derived from the deeply rooted patriarchal sense of the family, and everyone obeyed without question as this authority signified primarily the responsibility and welfare of all the members of the family, and in consequence the right to exercise justice].

H. J. H.

IMPERIAL BUREAU OF ANIMAL BREEDING AND GENETICS. — *Animal breeding in the light of genetics*. Seventh International Genetical Congress (Section D), Edinburgh, 1939.

[This recent publication of the Imperial Bureau of Animal Breeding and Genetics contains the reports presented at the VIIth International Genetical Congress, dealing with the questions on animal breeding treated in Section D of this Congress (Edinburgh, August, 1939). Brief summaries are also given of the discussions. The reports are divided into seven sections according to the programme of the Congress. (1) Progress of animal breeding. (2) Artificial insemination. (3) Statistical methods in genetics. (4) Milk control. (5) Selection according to yield. (6) Aviculture. (7) Various. The reports are all published in English.]

I. M.

BECKER-DILLINGEN, J., *Die Ernährung des Waldes, Handbuch der Forstnahrung*. Berlin, Verlagsgesellschaft für Ackerbau, 1939, XVI und 589 S., 120 Abb., Price. RM. 16.50.

[This publication, first of its kind, gives a study, in a simple and comprehensive manner, of a subject on which up to the present many detailed works were available but none in a collective form. The A. has utilized the experiences of scientists over a century as well as his own very extensive personal knowledge. Some idea of the work involved will be seen from the appended bibliography which contains 897 references. This volume is important not only for Germany but for the whole world. It is a veritable pioneer work opening up new horizons. A rapid review of the book is sufficient to see that a new trend is developing, clearly tending to an increase in forest utilization.

The following is a brief review of the different parts of the book. The first part is a brief discussion of pedology as regards forestry. The influence of different types of forest on the soil is treated in detail, particular importance being given to the question of raw humus. The appearance and action of acids in the soil is fully discussed. Details on the plants characteristic of various soils conclude this chapter. The second part treats on the physiological bases of plant nutrition, assimilation, water requirements, water provisions, light requirements, mycorrhiza, mineral elements, etc. The third part deals with manures and fertilizers, and suggestions are given on forest manuring. In the fourth part, the A. discusses the food requirements of different forest species.

N. G.

HEBBE, P. M., *Den svenska lantbrukslitteraturen*. v. 1. Från äldsta tid t. o. m. år 1800. Bibliografisk förteckning på uppdrag av Kungl. Lantbruksakademien. Uppsala, [Almqvist & Wiksell], 1939. [Swedish agricultural literature. From earliest times until 1800].

[This bibliography, compiled under the auspices of the Swedish Academy of Agriculture by Dr. Hebbe, the Librarian of the Lantbrukshögskolan (Agricultural College) at Stockholm, is a very important reference book for study and research on agriculture in Sweden.

The first, and so far the only, volume covers the period from the earliest times up to 1800 and represents therefore an invaluable aid for research in agricultural history. It is surprising to see what a large number and variety of scientific agricultural publications were produced by such a thinly populated country as Sweden was before 1800. The bulk of the material dates of course from the second half of the 18th century, the period of marked revival in agricultural studies and of radical changes in agricultural methods in most European countries.

The two thousand odd titles, comprising independent works as well as periodical articles and other material, are very conveniently grouped according to subject. Many of the bibliographical entries are carefully annotated, a feature that greatly increases their value. Readers with an insufficient knowledge of the Swedish language will appreciate the frequent references to translations in the more common world languages. The indication of abstracts and summaries published in various Swedish and foreign reviews will also prove rather useful.

The bibliography is a model of accuracy, completeness and convenient arrangement. The length of the printed lines is calculated to allow cutting and pasting on catalogue cards of international standard size, a useful feature for those who desire to insert bibliographical references in card files. The work is provided with a combined alphabetical author and subject index].

S. v. F. and H. J.

NEW PERIODICALS RECEIVED BY THE LIBRARY OF THE INTERNATIONAL INSTITUTE OF AGRICULTURE for the second quarter of 1940 (*).

AGRICULTURE; the journal of the Ministry of agriculture. London, v. 46 (1939/40)-, trim. 6d. par fasc. [Bildet die Fortsetzung zu «The Journal of the Ministry of agriculture»].

ARCHIV für Kleintierzucht. (Nachfolger des « Archiv für Geflügelkunde ») ...herausgegeben vom Reichsverband Deutscher Kleintierzüchter. Berlin, F. Pfennigstorff, v. 1 (1940)-, mens. RM. 12. - [Inhaltsangaben deutsch und englisch].

BIRMANIE. Department of agriculture. Markets section survey. Rangoon, Supt govt. printing and stationary, No. 1 1939)-, irr.

BOLETIN de agricultura y ganaderia... Organo de la Dirección de agricultura y ganaderia de Bolivar. Cartagena, v. 1 (1939)-, irr. (Republica de Colombia. Departamento de Bolivar. Secretaria de hacienda).

(*) List of abbreviations: bihebd. (biweekly); bimens. (twice monthly); bimestr. (every two months); déc. (every ten days); étr. (foreign price); fasc. (copy); hebd. (weekly); int. (home price); irr. (irregular); mens. (monthly); n° (number); N. S. (new series); p. a. (per annum); q. (daily); sem. (half yearly); s. (se; ries); trihebd. (every three weeks); v. (volume); trim. (quarterly).

N. B. — Between brackets [/] are given translations and explanatory notes not appearing in the title of the review.

- BOLLETTINO scientifico della Facoltà di chimica industriale. Bologna, [v. 1] (1940)-, mens. L. 50. - int.; L. 100. - étr. [Vorhergehende Reihe: «Zymologica e chimica dei colloidi»].
- BUENOS AIRES. Instituto de anatomia. [Publicación]. Buenos Aires, v. 1 (1938)-, irr. (Universidad de Buenos Aires. Facultad de agronomía y veterinaria).
- BUENOS AIRES. Instituto de clinica medica y quirurgica de animales pequeños. [Publicación]. Buenos Aires, v. 1 (1939)- irr. (Universidad de Buenos Aires. Facultad de agronomía y veterinaria).
- BUENOS AIRES. Instituto de clinica medica y quirurgica de equinos, rumiantes y cerdos. [Publicación]. Buenos Aires, v. 1 (1939)-, irr. (Universidad de Buenos Aires. Facultad de agronomía y veterinaria).
- BUENOS AIRES. Instituto de enfermedades infecciosas. [Publicación]. Buenos Aires, v. 1 (1938)-, irr. (Universidad de Buenos Aires. Facultad de agronomía y veterinaria).
- BUENOS AIRES. Instituto de genética. [Publicación]. Buenos Aires, v. 1 (1938)-, irr. (Universidad de Buenos Aires. Facultad de agronomía y veterinaria).
- BUENOS AIRES. Instituto de industrias agricolas. [Publicación]. Buenos Aires, v. 1 (1938)-, irr. (Universidad de Buenos Aires. Facultad de agronomía y veterinaria).
- BUENOS AIRES. Instituto de parasitologia y enfermedades parasitarias. [Publicación]. Buenos Aires. Facultad de agronomía y veterinaria).
- BUENOS AIRES. Instituto de quimica e investigaciones agropecuarias. [Publicación]. Buenos Aires, v. 1 (1938)-, irr. (Universidad de Buenos Aires. Facultad de agronomía y veterinaria).
- BUENOS AIRES. Instituto de zootecnia. [Publicación]. Buenos Aires, 1938)-, irr. (Universidad de Buenos Aires. Facultad de agronomía y veterinaria).
- COLLEGE and research libraries. Association of college and reference libraries. [Menasha, Wis.], [American library association], v. 1 (1939/40)- trim. \$ 3. - int.; \$ 3.25 étr.
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- DOKUMENTATION und Arbeitstechnik; zwanglose Mitteilungen des Fachnormenausschusses für Bibliotheks-, Buch- und Zeitschriftenwesen. Berlin, 1939-, mens.
- L'ÉCLAIREUR agricole et horticole; revue pratique des cultures méridionales et de l'Afrique du Nord... et la Revue oléicole. [Nice], v. 21 (1940)-, mens Fr. 30. - int.; Fr. 45. - étr. [Bildet die Fortsetzung zu: Revue oléicole].
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- JOURNAL of coconut industries. Colombo, Ceylon coconut board, v. 1 (Sept. 1937)-, trim.

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- (MOLOTCHNAIA promychlennost SSSR) Молочная промышленность СССР. Москва, v. 5 (1938)-, mens (vor 1939 bimestr.) Rb. 24. - [1938-1939 unter dem Titel: «Molotchnomaslovelinaia promychlennost »]. [Milchwirtschaft in Sowjetrußland.]
- PHILIPPINES. Department of agriculture and commerce. Popular bulletin. Manila, Bureau of printing, No. 1 (1934)-, irr.
- REVUE internationale des industries agricoles. Paris, Commission internationale des industries agricoles, v. 1 (1939)-, trim 40 fr. p. fasc.
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Prof. UGO PAPI, *Segretario generale dell'Istituto, Direttore responsabile.*

PLANT PROTECTION

INTERNATIONAL BULLETIN OF PLANT PROTECTION

DISCOVERIES AND CURRENT EVENTS *

ITALIAN EAST AFRICA

Movements of the African Migratory Locust †

Harrar Government. On January 20, 1939 the Residency of Dodolà (Goba) reported the passing of large swarms of *Locusta migratoria migratorioides* from the south. On the 22nd, further swarms invaded the Ticcì zone, continuing towards the south on the 23rd. On January 30 and 31, numerous dense swarms passed over the Densà region towards the east. During the first decade of February, swarms from Auasc flying in the direction of Urutà were reported; other swarms from the north-east passed over Ticcì. On February 12, some locusts passed over different zones of Arussi, Bolè and Cercer.

In the first decade of March, several swarms were observed in the Commissariat of Arussi, specially in the Ticcì zone, flying in various directions, and in the Adaba Sella Herà zone, Sciotera region. During the last fortnight of March, invasions were reported in the Ghimir, Goba and Gore zones and also at the beginning of April; in the Hadama zone, further invasions were reported, by swarms from the south-east, which then crossed the Auasc taking a westerly and easterly direction. Swarms were also observed in the Hadama territory in the last decade of April; the insects came from the south-east and continued towards the north-east.

During the first decade of May, locusts from Dancalia flew over the Billalo zone, over Villa Baka, Gascia and Asba Littorio. Other swarms from Gota settled in the Herrer zones, and continued towards Dire Dawa. Further swarms from the south-west crossed the Baka zone near Miesso towards the south-east; others again, from south-south-west, crossed the Arba zone, along the railway line. In the second decade of May, egg-laying was observed in Cercer territory, particularly on May 13 when swarms flew over Harrar and settled at Combolcià. During the second and third decade of the same month, the starting-point of the invasion was considered to be the Hadama Territory, around which developed the hopper bands and swarms from the east and south going north and west. On May 30, a swarm passed over the Aubarre zone, in the Commissariat of Giggiga.

* Under this and the next heading the countries are arranged in French alphabetical order.

† Communication from the Government General of Italian East Africa, Addis Ababa, transmitted to the Institute by the Ministry of Italian Africa, Rome.

Shoa Government. On February 12, swarms from the north-east settled outside Addis Ababa (Maccanise) and caused some damage, and then continued towards the west. On February 14, some swarms settled near Uolkittè; on the same day past Balti near Sukuri, a swarm about 2 km. long and a hundred metres wide was observed. On February 23, a swarm passed over Deddestò towards the south-west.

On April 17, swarms passed Sulultà. Towards the end of May, some hopper bands and nymphs came into activity in the territory situated between Biscofitù and Moggio, following a westerly and northerly direction. During the first decade of June, the situation remained unchanged.

Galla and Sidamo Government. This territory was seriously attacked in April 1939 by swarms from the west and north-west, they invaded the zones of Beni Sciangul, Wollega, Lekempti and Jimma where they damaged the crops. Observations carried out along the frontier zones showed that these swarms came from the Anglo-Egyptian Sudan.

ESTONIA

The Elm Disease in the Country *

Cerastomella ulmi (Schwarz) Buisman (*Graphium ulmi* Schwarz) probably made its appearance in Estonia between 1930 and 1935.

This fungus may now be observed throughout the country (11 districts). Many elms have already withered in consequence of the attacks of this parasite.

GREECE

Scale Insects Observed on Citrus in the Island of Crete †

With a view to protecting citrus cultivation in Greece, which is becoming of increasing importance, both in extent and in the export trade of the country, against diseases and pests, and in particular, against scale insects (*Coccidae*), it was considered advisable to identify the species already existing in the country and to determine the districts affected by each.

Dr. Jean Koronéos, well-known expert on scale insects, now working at the Benaki Phytopathological Institute, was requested to visit the regions where citrus cultivation is extensive in order to identify the scale insects found and to ascertain their importance in regard to damage caused.

Dr. Koronéos began his investigation in the Ionian Isles, the Aegean Islands and the island of Crete.

* Communication from Professor F. LEPIK, Director of the Phytopathological Experiment Station of the University, Tartu, Estonia.

† Communication from the official correspondent of the Institute, Mr. A. AYOUTANTIS, Chief of the Phytopathological Service, Ministry of Agriculture, Athens, Greece.

Investigations were begun in the islands as measures for preventing the introduction of new dangerous scale insects or the spread of the species already prevalent, can more easily be carried out.

The results of Dr. Koronéos' results are summarized as follows:—

Species Observed.

Chrysomphalus dictyospermi.

Chrys. (Aonidiella) aurantii.

Parlatoria zizyphi.

Lepidosaphes pinnaeformis (*L. beckii*).

Lecanium (Saissetia) oleae.

L. (Coccus) hesperidum.

Ceroplastes rusci.

Pseudococcus citri.

Icerya purchasi.

Area Affected and Damage Caused by the Above-Mentioned Scale Insects.

Chrysomphalus dictyospermi. Probably of recent introduction, either by pot plants, chiefly palms, or by citrus plants from other regions of Greece. Found throughout the Department of Canea, with the exception of a few districts.

Up to the present, this species is localized in the Department of Canea, where it is very prevalent and causes heavy damage. It was not seen in the other Departments of Crete.

Chrys. aurantii. Has been prevalent in Crete for some considerable time. Is found chiefly on the trunks, branches, leaves and fruit. In many cases, it is very widespread and harmful. In the Canea district, it appears to be replaced by *Chrys. dictyospermi*. *Citrus medica* and *C. limonum* are the species chiefly attacked; *C. deliciosa* (*C. nobilis*) only very slightly.

Parlatoria zizyphi. This species is found practically throughout the island of Crete, with the exception of the Department of Lassithi. In all the other departments it is very widespread and harmful.

Lepidosaphes pinnaeformis. Only observed at Spilia Kissamou, in the Department of Canea, and in the communal nursery of Iraklion (Candia) where it is very widespread. Probably introduced from other regions of Greece and perhaps independently in each case observed. It was not seen elsewhere in Crete.

Lecanium oleae. This species is very widespread throughout the island of Crete and is found on all *Citrus* species. It causes considerable damage. Especially prevalent in the Department of Canea.

L. hesperidum. This species is also found throughout the island of Crete, but is much less prevalent and does not spread so extensively as *L. oleae*.

It is very prevalent in the Hierapetra and Hagios Nicolaos districts in the Department of Lassithi and in the Department of Rethymno. On the whole, it is not very serious.

Ceroplastes rusci. This species is observed sporadically on *Citrus* spp. and is of little importance.

Pseudococcus citri. This species was found at Alikianou in the Department of Canea and at Hierapetra in the Department of Lassithi. It causes damage but does not appear to spread much. It is much less harmful than the first-mentioned species (*Chrysomphalus*, *Parlatoria zizyphi*, *Lecanium oleae*).

Icerya purchasi. This species is found everywhere, but attack is slight, owing to *Rodolia (Novius) cardinalis*.

Some Scale Insects Observed on Other Crops.

Aspidiotus hederac. Found on several occasions on carob trees, heavily infested causes damage throughout the island of Crete.

Parlatoria oleae. This species is not widespread and causes no damage to fruit trees in Crete as in continental Greece.

The results of the investigations to be carried out in the other regions of Greece on the species of scale insects found on *Citrus* spp. will be communicated in due course.

THE NETHERLANDS

Colorado Beetle Situation in 1939 *

Owing to the absence of the strong south winds, no heavy invasion of *Leptinotarsa decemlineata* from Belgium and France took place as in 1938. The more southerly provinces, however, were infested.

The region affected is more or less the same as in 1938, *i.e.*, to the south of the Rhine, apart from a small superficial focus 1 km. to the north of the river.

The foci number 242, of which 205 may be considered as superficial (one or a few adults, or a small number of small larvae) and 37 as being attached foci, spread over 121 communes.

On the trap-plants, planted around the attached foci found in 1938, in 9 cases, one or several adults have been captured. All these foci may be considered as extinct.

The situation at the moment appears more favourable than in 1938. In the part of the country lying south of the Rhine, all potato crops, in the fields and in gardens, have been sprayed three times with a 4 per cent. lead arse-

* Communication from the official correspondent of the Institute, Mr. N. VAN POETEREN, Engineer, Chief of the Phytopathological Service of the Netherlands, Wageningen.

nate mixture. This treatment was carried out by the growers or by the communal Services, but the lead arsenate was distributed free by the State. The treatment of new foci is assured by the State.

SOUTHERN RHODESIA

Locust Invasion, 1932-39 *

Monthly Report No. 81. August, 1939.

Movements of red locust (*Nomadacris septemfasciata*, Serv.) swarms have been reported in the following districts during August, namely: Lomagundi, Mazoe, Marandellas, Hartley, Chibi, and Matobo.

The swarms have been described as from 'small' to 'very large'.

Two swarms are stated to have entered the Chibi district from Mozambique territory on the 1st. The remaining reports appear to refer to swarms already within the Colony.

The general position is judged to be similar to that in August of last year. No damage has been reported.

Monthly Report No. 82. September, 1939.

Swarms of *N. septemfasciata* have been reported during the month from the districts of Sebungwe, Lomagundi, Mazoe, Salisbury, Hartley, Gwelo, Marandellas, Untali, Melsetter, Chibi, and Inyiza.

The swarms have been described as from 'small' to 'very large'. No definite trend of flight is apparent from the reports.

Such specimens as have been received have not been in breeding condition.

Sixty acres of wheat are stated to have been destroyed on a farm in the Melsetter district.

LEGISLATIVE AND ADMINISTRATIVE MEASURES

Italian East Africa. — Decree No. 803 of September 4, 1939 relative to the regulations for the conservation and management of coffee estates in Harar, provides, *inter alia*, that proprietors must replace at their own expense all plants removed because of disease, decay or poor growth.

On the appearance of parasitic diseases, coffee growers must immediately inform the local Government authorities who in turn will advise the Agricultural Office or the Agricultural Sections.

* Communication from the official correspondent of the Institute, Mr. RUPERT W. JACK, F. E. S., Chief Entomologist, Agricultural Laboratory, Department of Agriculture, Salisbury, Southern Rhodesia.

* Mon. 1 Engl.

Coffee growers are required to carry out the instructions issued by the Agricultural Services for disease control. If not executed within a certain period, control operations will be carried out by the Agricultural Services, expenses to be paid by the proprietor.

For crops attacked by rust (*Hemileia vastatrix*) the measures to be adopted are:—

- (a) collection and burning of diseased leaves in cases of incipient infection;
- (b) burning of stunted weak plants easily susceptible to the disease;
- (c) spraying with copper mixtures (if possible adherent solutions)—after the destruction of the centres of infection—of the foliage of the remaining trees.

Control of termites and ants according to the instructions issued by the Government Services is also compulsory. (*Giornale Ufficiale del Governo Generale dell'Africa Orientale Italiana e Bollettino Ufficiale del Governo dello Scioa*, Parte prima, Addis Abeba, 27 settembre 1939, anno IV, n. 23, pp. 894-895).

Germany. — A Decree of July 1, 1939 issued with a view to preventing the introduction of diseases and pests of plants cultivated in former Austria (Ostmark) and in the Sudeten districts (Sudetenland) prohibits the import of the following plants:—

- (a) Coniferae belonging to the genera *Abies*, *Picea*, *Pinus*, *Pseudotsuga*, and *Tsuga*;
- (b) Carnations (plants and cuttings);
- (c) Rooted plants, cuttings and any other living part of the genus *Ulmus* and of the Canadian poplar (*Populus canadensis*).

The import of carnations (cut flowers) is prohibited during the period March 15 to November 30.

Some products may only be imported if free from certain specified diseases and pests. Mention is made of (a) cherries: the cherry fruit fly [*Rhagoletis cerasi*]; (b) fresh fruits, living plants and parts of same: San José scale [*Aspidiotus perniciosus*] and the apple maggot [*Rhagoletis pomonella*]; (c) potatoes: wart disease [*Synchytrium endobioticum*]; (d) bulbs of horticultural plants: *Pseudomonas hyacinthi*, *Sclerotinia bulborum*, *Sclerotium tuliparum*, *Botrytis tulipae*, *Penicillium* sp., *Anguillulina dipsaci*, *Merodon* sp., *Eumecurus* sp., and *Rhizoglyphus echinopus*.

The above-mentioned products may only be imported through specially authorized custom-houses, and will be examined by officers of the Plant Inspection Service. (*Ämtliche Pflanzenschutzbestimmungen*, Berlin, 1. August 1939, Bd. XI, Nr. 4, S. 93-95).

* * In conformity with the Decree of August 8, 1939 grapes are included among the fruits classed as 'berries', which according to the Decree of May 24, 1939 [see this *Bulletin*, 1939, No. 9, p. 211] are exempted from the measures prescribed by the Decrees relative to the introduction of the San José scale [*Aspidiotus perniciosus*]. (*Nachrichtenblatt für den Deutschen Pflanzenschutzdienst*, Berlin, Anfang September 1939, 19. Jahrg., Nr. 9, S. 91).

* * A provision dated August 10, 1939 establishes that in 1940 not more than 1200 ha. may be planted with the 'Erstling' variety, non-resistant to the potato wart disease [*Synchytrium endobioticum*], for seed.

Detailed provisions establish the system to be employed in dividing this very reduced area among the different provinces and farms specializing in the production of seed potatoes. (*Ibid.*, S. 90).

* * A Notification of August 14, 1939 states certain exceptions to the Decree of October 8, 1937 [see this *Bulletin*, 1938, No. 2, pp. 28-29] relative to the control of potato wart disease [*Synchytrium endobioticum*].

The non-resistant variety 'Erstling' may still be cultivated in 1941 in certain districts recognized as special centres for the production of very early potatoes. Of the area allotted for early varieties, however, only 35 per cent. may be allowed for the 'Erstling' variety, the remaining 65 per cent. to be planted with early varieties resistant to wart disease such as 'Primula', 'Frühmölle', 'Frührote', 'Früheste Delikatess' or 'Sieglinde'.

Until further notice, seedlings of the varieties 'Allerfrüheste Gelbe' and 'Centifolia', non-resistant to wart disease, may still be produced after July 1, 1940 for export and for farms which will have received a special authorization. (*Ämtliche Pflanzenschutzbestimmungen*, Berlin, 1. September 1939, Bd. XI, Nr. 5, S. 117-118).

* * By Decree of August 15, 1939, the Minister of Agriculture, taking into consideration that the potato varieties resistant to wart disease [*Synchytrium endobioticum*] have almost entirely replaced the non-resistant varieties and that consequently the danger of this disease spreading is now considerably reduced, agrees that the seal of the Plant Protection Service need no longer be applied to packages and sacks of potatoes imported by rail; the official seal is only necessary for the truck. (*Nachrichtenblatt für den Deutschen Pflanzenschutzdienst*, Berlin, Anfang September 1939, 19. Jahrg., Nr. 9, S. 91).

* * By Decree of August 21, 1939, fresh fruits and vegetables used by the international Wagons-lits Company are exempted from the prescriptions relative to the introduction of the San José scale [*Aspidiotus perniciosus*] and apple maggot [*Rhagoletis pomonella*]. The quantities brought, however, must not exceed the requirements of the restaurant service. (*Ibid.*, S. 91).

Germany (Bohemia and Moravia Protectorate). — Decree No. 45 of February 27, 1939 indicates in detail the control measures to be taken against the Colorado beetle (*Leptinotarsa decemlineata*).

Every land-owner, and any person in general, who has found or suspects the presence of the Colorado beetle in a particular piece of land must report it within 24 hours, providing at the same time a specimen of the insect or the object giving rise to his suspicions (e. g. a nibbled leaf).

The Burgomaster of the commune must at once notify the local Experiment Station, sending the suspected specimen and take the necessary measures to ensure that no potatoes, plants or soil leave the suspected land.

If the Experiment Station confirms the presence of the Colorado beetle, it must notify the authorities in the commune concerned and to those of the district within the next 24 hours.

The Burgomaster will publish the information, in the usual way, that the Colorado beetle has been found in the district, at the same time indicating exactly in what place and giving the name of the land owner. A notice warning the public of the presence of the beetle is to be posted up on the property at once.

The district authorities will declare the whole commune as an infested area and all those within a radius of 15 kilometers as threatened zones.

The Minister of Agriculture will declare the infested and threatened areas as a closed zone in which a series of well defined measures must be taken:

(a) Prohibition of transport or movement of living Colorado beetles, potatoes, other plants, soil, etc. from the infested zone.

(b) Destruction of the beetle on the infested land.

(c) Disinfection of the land.

(d) Compulsory planting of potatoes on the infested soil and compulsory examination of the soil.

(e) The institution of 'Colorado beetle days' devoted to collecting and destroying the beetles.

(f) Compulsory notification of all land planted with potatoes.

The Minister of Agriculture may make other provisions. He is also empowered to enlist the help of schools, 'workmens' organizations, etc. for the control of the Colorado beetle.

The introduction and transport of living Colorado beetles are prohibited.

Similarly, it is forbidden to import living plants or parts of living plants, plant refuse, etc. that are infested with the Colorado beetle. This prohibition extends also to packing material and to every object that has been in contact with infected plants.

Finally, it is prohibited to import living plants, parts of living plants, plant refuse, packing materials or anything that has been in contact with them if they come from a country known to be infested with Colorado beetle.

The Minister of Agriculture may make exceptions to this last regulation if the consignment is accompanied with a certificate of condition and origin of which an example is given as an annexe to the present decree. An examination by an official of a Station designated by the Minister of Agriculture will be necessary on entry. The procedure for inspection is given in detail.

The transit of consignments coming from a district known to be infested with Colorado beetles is permitted on condition that the packages are securely closed and intact, or if the transport takes place in tightly closed vehicles.

The Decree of February 25, 1938 and the modification introduced by the Decree of June 24, 1938 [see this *Bulletin*, 1938, No. 6, p. 128, and 1939, No. 3, p. 58] are rescinded. (*Amliche Pflanzenschutzbestimmungen*, Berlin, 1. November 1939, Bd. XI, Nr. 6, S. 137-145).

** According to a Notification of March 23, 1939 the countries covered by the Decree of February 27, 1939 (see above) and considered as infested by the Colorado beetle are the following:— Belgium, France, the Netherlands, Luxemburg, Canada, Germany, United States of America, and Switzerland. (*Ibid.*, S. 146).

** Another Notification of the same date explains the exceptions that are made to the regulation prohibiting the importation of plants, etc. from countries infested with the Colorado beetle.

The importation of fresh fruit, vine cuttings, flower bulbs, and a whole series of different plants is allowed. The list includes 93 scientific names of plants (generic and specific).

It is also permissible to import cut flowers between October 1, and May 15, and azaleas and araucarias from January, to April 15. The consignments however must be accompanied by a certificate of condition and origin and an example of such a certificate is appended to the present decree. (*Ibid.*, S. 146-147).

** Under a notification of May 19, 1939 the provisions of the Decree of August 9, 1935 [see this *Bulletin*, 1936, No. 3, p. 58] made with a view to preventing the introduction of San José scale (*Aspidiotus perniciosus*) are extended to Slovakia, the presence of this insect having been discovered there. It is therefore forbidden to import from Slovakia any living plants, vine cuttings, grafts or other parts of living plants, including plant refuse or material that has been in contact with such products, especially barrels, boxes, sacks and other materials and packing. (*Ibid.*, S. 148-149).

Germany (Brunswick). — A Decree of September 9, 1939, concerning the protection of bees forbids the use of arsenicals on fruit trees and horticultural and field crops when they are in flower; in particular this applied to asparagus and rape.

Fruit trees growing near apiaries may only be sprayed with copper or arsenical sprays in the evening after the bees have returned and preliminary warning must be given to the bee keeper.

These regulations do not apply to vines or to the treatment of potato crops with arsenicals or to crops grown for scientific and experimental purposes. (*Amliche Pflanzenschutzbestimmungen*, Berlin, 1. November 1939, Bd. XI, Nr. 6, S. 136-137).

Germany (Sudetenland). — By Decree of August 23, 1939, the trade in poisons is regulated by the Police Ordinance of January 11, 1938 [see this *Bulletin*, 1938, No. 4, p. 78] that is in force in Prussia. (*Nachrichtenblatt für den Deutschen Pflanzenschutzdienst*, Berlin, Anfang November 1939, 19. Jahrg., Nr. 11, S. 105).

Australia (Western Australia). — On September 27, 1939 wild radish (*Raphanus raphanistrum*) and double gee (*Emex australis*) have been declared to be noxious weeds within the boundaries of the Mukinbudin Road Board and Preston Road Board districts respectively. (*Government Gazette of Western Australia*, Perth, September 29, 1939, No. 47, p. 1714).

Canada. — The Pest Control Products Act (Chapter 5, 1927 and chapter 21, 1939) regulates the sale of products used in controlling agricultural pests. (*The Pest Control Products Act (Office Consolidation of the Agricultural Pests' Control Act, 1927, as amended in 1939). Administred by the Plant Products Division, Production Service, Ottawa, 1939, 13 pp.*).

Spain. — By 'Orden' issued on September 22, 1939, the measures to be adopted in this country for the locust control have been specified. (*Boletín Oficial del Estado*, Madrid, 27 septiembre 1939, año IV, núm. 269, págs. 5343 a 5345).

United States of America. — By Amendement No. 1 to the rules and regulations (seventeenth revision) supplemental to Notice of Quarantine No. 48 on account of the Japanese beetle [*Popillia japonica*], approved on June 22, 1939 and effective on July 1, 1939, the regulations 3, 5, 6, 7 and 9, which were promulgated on February 16, 1939 [see this *Bulletin*, 1939, No. 11, p. 264], are amended. (*B. E. P. Q. — Q. 48*, [Washington, D. C., 1939], 9 pp.).

* *. An Act approved on August 9, 1939 authorizes the Secretary of Agriculture to prepare plans for the eradication and control of the pink bollworm [*Pectinophora (Platyedra) gossypiella*] affecting cotton within the United States and Mexico. ([*Public-No. 351-76th Congress*]. [*Chapter 612-1st Session*]. [*H. R. 4638*]. [Washington, D. C., 1939], 1 p.).

Italy. — A specialized course in plant diseases has just been instituted under the auspices of the Ministry of Agriculture and Forests at the University of Pisa. This course will commence with the academic year 1939-40.

Its purpose is to allow young graduates in agriculture, forestry, natural sciences and biology to complete their studies in plant diseases and their identification so that a high standard of professional training may be assured.

Jamaica. — By Government Notice No. 712 published on September 10, 1938, the transshipment of citrus fruits from Spanish Honduras and British Honduras at the port of Port Antonio will be allowed *inter alia* on the condition that the fruit must be free from pest and disease. (*Jamaica, British West Indies. Government Notice No. 712. Jamaica Gazette Extraordinary, 10th September 1938, 1 p.*).

Mauritius. — Proclamation No. 21 of August 24, 1939 declares that all citrus trees growing on any land within the Island of Rodrigues are infected with citrus canker (*Pseudomonas citri*).

The Director of Agriculture or any person deputed by him may at any time inspect any lands where citrus trees grow and cause the destruction, removal, disposal or treatment of any plants found to be infected or suspected of being infected with the disease. (*Legal Supplement to the Official Gazette of the Mauritius Government*, No. 51 of August 26th, 1939. *Proclamations 1939*, pp. 37-38).

Mexico. — 'Acuerdo' of June 29, 1939 prescribes the general regulations regarding the control of Sigatoka disease [*Cercospora musae*], locally known as 'chamusco' [see also this *Bulletin*, 1939, No. 11, p. 266]. (*Diario Oficial*, México, 27 de julio de 1939, tomo CXV, núm. 23, págs. [1] a 3).

New Zealand. — By Special Order made by the Clutha County Council on August 1, 1939 and published by the Minister of Agriculture on September 1, 1939, ragwort [*Senecio jacobaea*] is declared to be a noxious weed within the said County. (*The New Zealand Gazette*, Wellington, September 14, 1939, Numb. 112, p. 2496).

Union of South Africa* — By Proclamation No. 155 of July 22, 1939, from and after February 1, 1940, the Schedule to Proclamation No. 286 of November 6, 1936 [see this *Bulletin*, 1937, No. 5, pp. 99-102] is amended by the insertion after sub-paragraph (b) of paragraph (2) of clause 4 of the following new sub-paragraph.—

'(c) A certificate from the Department of Agriculture of the declared country of origin, or a certificate from some official institution in that country which the Minister has agreed to recognise, stating that the crop from which the potatoes were derived was officially inspected in the field and that the degree of freedom from virus diseases was sufficiently high to ensure the suitability of the progeny for seed purposes, and stating further that the said crop was not grown in the vicinity of any unhealthy potato crops or other plants infected with potato virus diseases.'

Uruguay. — The Decree No. 380/935 of May 24, 1939, modifying the Decree No. 380/935 of September 29, 1937 [see this *Bulletin*, 1938, No. 3, p. 57] regulating the agricultural insecticide and fungicide trade, makes it obligatory to have all labels used to mark the above preparations approved. The text of such labels must conform to the results of official trials and analyses. (*Diario Oficial de la República Oriental del Uruguay*, Montevideo, 10 de junio de 1939, tomo 135, núm. 9829, pág. 435-A).

* Communication from the Department of Agriculture and Forestry, Division of Entomology, Pretoria, Union of South Africa to the International Institute of Agriculture.

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[For the three first issues of the sixth volume, see this *Bulletin*, 1939, No. 3, p. 58.

This fourth issue contains:—

Dritter Abschnitt: Die technische Mittel des Pflanzenschutzes.

B. Spritzgeräte von Hermann Zillig (Fortsetzung und Schluss, S. 209-219).

C. Staubegerate von Hermann Zillig (S. 219-233)

Motorverstäuber von Hermann Voelkel (S. 233-259).

D. Flugzeug von Hermann Voelkel (S. 260-286).

E. Vergasungs-, Vernebelungs-, Verbrennungsgeräte von Hermann Zillig (S. 287-303).

Vierter Abschnitt: Die Bewertung des Saat- und Pflanzgutes.

Allgemeines. Begriffsumgrenzung von Otto Schlumberger (S. [304]-313).

I. Die Feststellung übertragbarer parasitärer Krankheiten und Schädlinge am Saatgut von Otto Schlumberger (S. 313-342).

II. Die Prüfung der Echtheit und Reinheit widerstandsfähiger Sorten von landwirtschaftlichen Kulturpflanzen von K. Snell (S. 343-361).

Fünfter Abschnitt: Anbau und Zuchtung krankheitsresistenter Sorten.

I. Einleitung von E. Köhler (S. [302]-370).

II. Resistenz gegen pflanzliche Parasiten von E. Köhler (S. 370-393).

III. Resistenz gegen Vira von E. Köhler (S. 393-398).

IV. Resistenz gegen tierische Parasiten und Schädlinge von E. Köhler (S. 399-400)].

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Prof. UGO PAPI, *Segretario generale dell'Istituto, Direttore responsabile.*

INTERNATIONAL BULLETIN OF PLANT PROTECTION

DISCOVERIES AND CURRENT EVENTS *

ARGENTINE REPUBLIC

The 'Mancha Bacteriana' of the Tomato †

Investigations have been carried out by Dr. Lydia S. Spaini, of the Phytopathological Division at the Ministry of Agriculture, with a view to determining the causal agent of the 'mancha bacteriana' of the tomato in the Republic.

This disease appears on the leaves in the form of small dark green spots, soaked in aspect, which become somewhat circular in shape with a translucent yellow border; on the young fruits green or brown blotches appear, surrounded by a thin dark ring and when the fruits ripen, the part around the lesion remains green.

A series of inoculations on tomato leaves, stems and fruits giving positive results obtained proved that this disease is caused by *Phytomonas vesicatoria* (*Bacterium vesicatorium*).

BRASIL

Diseases of Cultivated or Useful Plants, Observed in the State of São Paulo §

This is the second list of diseases of cultivated or useful plants studied at the Laboratory of Plant Pathology of the São Paulo Biological Institute in 1937-38 (for the first list, see this *Bulletin*, 1937, No. 12, pp. 269-275 and 1938, No. 3, pp. 49-53). The diseases reported in the previous list and observed again in 1937-38 are not cited.

The recognition of the diseases and pests enumerated in the list below was made by the author of this communication and by Messrs. Raul Drummond Gonçalves and Spencer Corrêa de Arruda, assistants at the aforesaid Institute.

* Under this and the next heading the countries are arranged in French alphabetical order,

† Communication from the official correspondent of the Institute, Mr. JUAN B. MARCHIONATTO, Agricultural Engineer, Director of the 'Sanidad Vegetal', Ministry of Agriculture, Buenos Aires, Argentine Republic.

§ Communication from the official correspondent of the International Institute of Agriculture, Mr. AGESILAU A. BITANCOURT, Assistant Director of the Biological Institute, Ministry of Agriculture, Industry and Commerce of the State of São Paulo, Brazil.

WINTER-CHERRY (<i>Physalis alkekengi</i> L.).	<i>Entyloma physalidis</i> (Kalkbr. and Cke.) Wint.
GROUNDNUT (<i>Arachis hypogaea</i> L.).	<i>Sphaceloma arachidis</i> Bitancourt and Jenkins.
AVOCADO (<i>Persea americana</i> Mill.).	<i>Cephaleuros mycoidea</i> Karst.
BANANA (<i>Musa</i> spp.).	<i>Chloridium musae</i> G. Stahel. <i>Polyporus sapurema</i> A. Möller.
COFFEE (<i>Coffea arabica</i> L.).	Leaf and fruit spots (virus).
SUGAR CANE (<i>Saccharum officinarum</i> L.).	<i>Pyrenochaeta sacchari</i> Bitancourt.
CITRUS (<i>Citrus</i> spp.).	<i>Elsinoe australis</i> Bitancourt and Jenkins. <i>Rhizoctonia</i> sp., <i>Pythium</i> sp., <i>Fusarium</i> sp., <i>Colletotrichum gloeosporioides</i> Penz. <i>Botryosphaeria ribis</i> Grossenb. and Duggar. <i>Fusarium</i> sp.
EUCALYPTUS (<i>Eucalyptus</i> spp.).	<i>Coniothecium</i> sp.
GUAVA (<i>Psidium guayava</i> L.).	<i>Sphaceloma</i> sp.
JASMIN (<i>Jasminum sambac</i> L.).	<i>Elsinoe jasmini</i> Bitancourt and Jenkins.
IVY (<i>Hedera helix</i> L.).	<i>Vermicularia trichella</i> Er.
MAIZE (<i>Zea mays</i> L.).	<i>Sphaerulina maydis</i> P. Henn. <i>Myriogenospora aciculisporae</i> Vizioli.
MANGO (<i>Mangifera indica</i> L.).	<i>Sphaceloma</i> sp.
CASSAVA (<i>Manihot utilissima</i> L.).	<i>Rosellinia</i> ? <i>bunodes</i> B. and Br.
CARNATION (<i>Dianthus caryophyllus</i> L.).	<i>Sclerotium rolfsii</i> Sacc.
BARLEY (<i>Hordeum vulgare</i> L.).	<i>Ustilago hordei</i> (Pers.) K. and S.
PEPPER (<i>Capsicum annuum</i> L.).	<i>Colletotrichum</i> sp.
CASHEW-NUT (<i>Anacardium occidentale</i> L.).	<i>Cercospora anacardii</i> Müll. and Chupp. <i>Gloeosporium</i> sp.
CASTOR-OIL PLANT (<i>Ricinus communis</i> L.).	<i>Ceratostomella</i> sp., <i>Fusarium orthoceras</i> var., <i>Phytophthora</i> sp. <i>Alternaria</i> sp.

TEA (<i>Thea sinensis</i> L.)	<i>Elsinoe theae</i> Bitancourt and Jenkins
GRAPE VINE (<i>Vitis</i> spp.)	<i>Leptothyrium pomae</i> Mont
<i>ABUTHION STRIATUM</i> Dicks	<i>Sphaceloma</i> sp
<i>ACHRAS SAPOTA</i> L.	<i>Elsinoe</i> sp
<i>AGAVE AMERICANA</i> L.	<i>Rhynchostoma</i> sp
<i>ANONA CHIKIMOIIA</i> Mill and <i>A. SOLIMOSA</i> L.	<i>Sphaceloma</i> sp
<i>LIERRHOA CARIIMBOI</i> L.	<i>Sphaceloma</i> sp
<i>BOUGAINVILLEA SPECIABILIS</i> Willd	<i>Bacterium</i> sp
<i>CINIKOLOBIUM ROBUSTUM</i> Mart	<i>Sphaceloma</i> sp
<i>CHOKISIA SPECIOSA</i> St Hil	<i>Phyllactinia</i> sp
<i>CITRUS BRASILIENSIS</i> Cham	<i>Elsinoe clethrae</i> Bitancourt and Jenkins
<i>CUCUMIS ANGIURIA</i> L.	<i>Puccinia cucumeris</i> P Henn
<i>LYTHRINA RITICULATA</i> Mart	<i>Sphaceloma</i> sp
<i>PLUMA THANGA</i> Kt	<i>Elsinoe pitangae</i> Bitancourt and Jenkins
<i>PICUS LUSCHNATHIANA</i> Miq	<i>Sphaceloma</i> sp
<i>HICKIA PICIN</i> (Marsch.) Britt	<i>Elsinoe randii</i> Jenkins and Bitancourt
<i>JAMBOSA VULGARIS</i> DC	<i>Puccinia jambosae</i> P Henn
<i>LUCUMA CAIMITO</i> DC	<i>Pestalozzia</i> sp ? Virus <i>Uredo</i> sp
<i>MACHAIKUM</i> sp	<i>Pseudothys subcoccodis</i> (Speg.) Theiss
<i>MYRCIARIA JABOTICABA</i> Berg	<i>Sphaceloma</i> sp
<i>OCOTEA PULCHRELLA</i> Mart	<i>Drepanoconis larviformis</i> Speg
<i>PASPALUM Plicatum</i> Mich and <i>P. PROLIFERUM</i> Arech	<i>Claviceps paspali</i> Stev and Hall
<i>PAVONIA SPINIFEX</i> (L.) Cav	<i>Sphaceloma</i> sp
<i>RHUS VERNIA</i> L.	<i>Sphaceloma rhois</i> Bitancourt and Jenkins.

MOZAMBIQUE

Fungi, Bacteria and Diseases of Unknown Origin Observed in the Colony *

The following is a list of the fungi, bacteria and diseases of unknown origin observed in the Colony of Mozambique. The author of this report was assisted by Mr. J. Peres Guimarães.

<i>Citrus sinensis</i> (L.) Osbeck	<i>Oospora citri-aurantii</i> Ferraris. Melanosis (cause unknown). Psorosis (cause unknown). Follicellosis (cause unknown).
<i>C. nobilis</i> Lour.	Melanosis (cause unknown).
<i>C. limonia</i> Osbeck	<i>Cephaleuros mycoidea</i> Karst.
<i>Prunus persica</i> Stokes	<i>Alternaria</i> sp. <i>Phyllosticta prunicola</i> Sacc.
<i>P. domestica</i> L.	<i>Cephaleuros mycoidea</i> Karst.
<i>Pyrus malus</i> L.	<i>C. mycoidea</i> Karst.
<i>Persea gratissima</i> Gaertner	<i>C. mycoidea</i> Karst.
<i>Ficus carica</i> L.	<i>Cercospora</i> sp.
<i>Morus</i> sp.	<i>Phyllactinia corylea</i> (Pers.) Karst. <i>Capnodium</i> sp.
<i>Carica papaya</i> L.	<i>Phyllactinia corylea</i> (Pers.) Karst.
<i>Carya pecan</i> Engl. and Graebn.	<i>Cercospora fusca</i> Rand.
<i>Gelonium adenophorum</i> Muell. Arg.	<i>Capnodium</i> sp.
<i>Afzelia quanzensis</i> Welw.	<i>Septoria</i> sp. <i>Phyllactinia corylea</i> (Pers.) Karst.
<i>Magnolia grandiflora</i> L.	<i>Cephaleuros mycoidea</i> Karst.
<i>Eucalyptus citriodora</i> Hooker	<i>C. mycoidea</i> Karst.
<i>Tristania conferta</i> R. Brown	<i>C. mycoidea</i> Karst.
<i>Ricinus communis</i> L.	<i>Melampsorella ricini</i> (Biv. and Bern.) De Toni. <i>Cercosporina ricinella</i> (Sacc. and Berl.) Speg.
<i>Coffea arabica</i> L.	<i>Hemileia vastatrix</i> B. and Br. <i>Cercospora coffeicola</i> B. and Cke. <i>Capnodium</i> sp. <i>Cladosporium herbarum</i> Link.

* Communication from the official correspondent of the Institute, Mr. JÚLIO GARDÉ ALFARO CARDOSO, Laboratory of Mycology of the 'Repartição Técnica de Agricultura', Lourenço Marques, Mozambique.

<i>Jasminum odoratissimum</i> L.	<i>Capnodium</i> sp.
<i>Gardenia</i> sp.	<i>Capnodium</i> sp.
<i>Chrysanthemum</i> sp.	<i>Septoria chrysanthemella</i> Sacc.
<i>Gerbera</i> sp.	<i>Cercospora</i> sp.
<i>Solanum lycopersicum</i> L.	<i>Colletotrichum phomoides</i> (Sacc.) Chester. <i>Bacterium solanacearum</i> (E. F. Smith) E. F. Smith, 1914.
<i>Nicotiana tabacum</i> L.	Leaf curl (cause unknown). Mosaic (cause unknown).
<i>Vicia faba</i> L.	<i>Alternaria</i> sp.
<i>Vicia</i> sp.	<i>Erysiphe polygoni</i> DC.
<i>Manihot utilissima</i> Pohl	<i>Septogloeum manihotis</i> Zimm.
<i>Vitis vinifera</i> L.	<i>Plasmopora viticola</i> (Berk. and Curt.) Berlese and de Toni.
<i>Zea mays</i> L.	<i>Sorosporium reilianum</i> (Kühn) McAlp. <i>Fusarium</i> sp. <i>Diplodia zeae</i> (Schw.) Lév.
<i>Hordeum</i> sp.	<i>Ustilago hordei</i> (Pers.) Kell. and Sw. <i>Helminthosporium teres</i> Sacc.
<i>Oryza sativa</i> L.	<i>Helminthosporium</i> sp.
<i>Cocos nucifera</i> L.	<i>Fusarium</i> sp. <i>Diplodia palmicola</i> Thunb. <i>Pestalozzia palmarum</i> Cke.
<i>Chamaerops</i> sp.	<i>Helminthosporium</i> sp. <i>Capnodium</i> sp.
<i>Musa</i> sp.	<i>Thielaviopsis paradoxa</i> (De Seynes) von Höhn. <i>Glocosporium musarum</i> Cke. and Massee. <i>Fusarium</i> sp. <i>Cordana musae</i> (Zimm.) von Höhn. Mosaic (cause unknown).
<i>Medicago sativa</i> Mor.	<i>Uromyces striatus</i> Schr.
<i>Arachis hypogaea</i> L.	<i>Cercospora personata</i> (B. and C.) Ellis. Rosette (cause unknown).
<i>Gossypium</i> sp.	<i>Bacterium malvacearum</i> E. F. Smith.
<i>Anarcadium occidentale</i> L.	<i>Cephaleuros mycoidea</i> Karst.
<i>Conopharyngia elegans</i> Stapf	<i>Puccinia callistea</i> Syd.
<i>Phragmites</i> sp.	<i>Puccinia phragmites</i> (Schum.) Korn.
Various host plants	<i>Rhizopus migricans</i> Ehrenb. <i>Aspergillus niger</i> v. Tiegh.

ITALIAN SOMALILAND

Locust Movements *

From June 1 to 2, 1939, a large swarm from the north-eastern zone of Rangi passed over Dolo towards Barrei.

On the 3rd, a heavy invasion, also egg-laying, was reported in the Uel-scimbirrò zone, situated on the frontier of the Bur Acaba and Audegle territory, and in the Doi region.

On the 4th, another swarm from Goriamo (Malca Rieh) directed towards Barabir and Aulihan again flew over Dolo; no egg-laying.

On the same day, a large swarm was reported in the Imi zone flying towards Carrei.

On the 5th, a large swarm from the left bank of the Ganale Doria moved towards the west, flying over Lamascillindi and continuing in the direction of Elemedo.

On the 7th and 8th, another swarm from Imi, taking a north-easterly direction, flew over Nascidle.

On the 10th, a small swarm was observed passing over Aramaio territory continuing towards Buslei without stopping.

On the same day, a large swarm flew over the Arcadei district, near Callafo for three hours; there was no egg-laying and little damage. The swarm continued towards the north-east. In the afternoon, another large swarm passed over Mustahil towards Scillave, in the Bor Bare and Ghel zones; there was no egg-laying.

On the 13th, a large swarm was reported over Callafo and Uebi Scebeli; on the 14th, the swarm continued its route, one part towards Gabredarre and the other towards Scillave where some damage was caused.

On the 15th, near Tigieglò, several swarms were observed in the Biolei, Cal, Dersin and Corar districts, though no egg-laying took place. On the same day, a small swarm was seen between Beira and Dubdub, part of which continued towards the south and the remainder towards the north.

On the 18th, a large swarm arrived at Gabredarre.

Since that date, no further appearances have been recorded.

In the invaded area, control operations carried out up to June 28 by the staff of the Agricultural Services, assisted by the local authorities and the natives, gave satisfactory results.

The traditional systems of control adopted by the natives (ditches) were supplemented by scientific methods applied by the European staff and supervised by workers and technicians of the Agricultural Services.

* Communication from Dr. LUIGI BOZZI, Chief of the Agricultural Services of Italian Somaliland, Mogadiscio, transmitted to the Institute by the Government of the Colony.

SWITZERLAND

The Colorado Beetle Situation in 1939 *

Despite the very wet and cold weather unfavourable for the development of the Colorado beetle (*Leptinotarsa decemlineata*) in Switzerland, during June and July, 1939, a very severe invasion was reported chiefly in the cantons of French Switzerland bordering France. In German Switzerland, the outside limit fixed last year has been considerably exceeded, and there are now some foci in the cantons of Saint-Gall, Obwalden and Zug.

The following table gives the foci reported in French Switzerland up to July 10, and in German Switzerland up to July 15; in the cantons of Geneva, Vaud, Neuchâtel and Berne (Jura), the foci have become too numerous to count:—

FRENCH SWITZERLAND

Geneva	41	communes infested with about	2,000	foci (under control).
Vaud	348	" " " over	4,500	" " "
Neuchâtel	59	" " " about	2,000	" " "
Bernese Jura	100	" " " "	3,000	" " "
Fribourg	154	" " " "	1,000	" " "
Valais	8	" " " "	22	" " "

Total 710 communes infested with approximately 12,000 foci

GERMAN SWITZERLAND.

Zurich	20	communes infested with	27	foci (under control).
Bern (excluding Jura)	76	" " " "	194	" " "
Luzern	30	" " " "	81	" " "
Obwalden	1	" " " "	1	" " "
Zug	1	" " " "	4	" " "
Solothurn (about)	82	" " " "	283	" " "
Basel-Stadt	2	" " " "	18	" " "
Basel-Land	45	" " " "	175	" " "
Schaffhouse	3	" " " "	3	" " "
Saint-Gall	1	" " " "	1	" " "
Aargau	72	" " " "	194	" " "

Total 333 communes infested with about 194 foci

* Communication from Dr. F. T. WAHLFN, Director of the Federal Agricultural Experiment Station, Zurich-Oerlikon, Switzerland.

Extensive surveys have been carried out in all the districts and control measures are being continued according to the methods prescribed by the International Committee for the Mutual Study of the Control of the Colorado Beetle. Combined applications of lead arsenate and Bordeaux mixture are usually employed.

LEGISLATIVE AND ADMINISTRATIVE MEASURES

Germany. — By virtue of an Ordinance dated August 10, 1939, the variety of potatoes 'Erstling', not resistant to wart disease [*Synchytrium endobioticum*] may be cultivated over an area of 1200 hectares for the production of certified seed, in spite of the previous Ordinance of September 16, 1937, concerning the elimination of varieties of potatoes not resistant to this disease [see this *Bulletin*, 1938, No. 2, p. 28]. However, the permission to grow these potatoes is limited to certain administrative units that are expressly stated in the Ordinance. (*Amtliche Pflanzenschutzbestimmungen*, Berlin, 7. Dezember 1939, Bd. XI, Nr. 7, S. 172-173).

* * Notification of September 20, 1939 modifying the seventh Decree of May 4, 1939, [see this *Bulletin*, 1939, No. 7, pp 157-159] relative to the Colorado beetle [*Leptinotarsa decemlineata*], authorizes the introduction of rooted plants free from adhering soil during the period from October 10 to November 14 on the same conditions fixed by the said Decree for imports made during the period November 15-March 31 (*Nachrichtenblatt für den Deutschen Pflanzenschutzdienst*, Berlin, Anfang Oktober 1939, 19. Jahrg., Nr. 10, S. 97)

* * By Ordinance of September 1939, the Ministry of Agriculture, inasmuch as inspection of the nurseries in the Sudeten region for San José scale [*Aspidiotus perniciosus*] showed no trace of this insect, authorizes the phytosanitary restrictions relative to the trade in plants between the Sudeten region and the rest of Germany to be lifted. (*Ibid.*, S. 97-98).

* * By Decree of October 11, 1939, contrary to the hunting regulations of July 3, 1934, the use of gins is permitted until further order. Persons concerned must however apply for special permission from the competent authorities. (*Ibid.*, S. 175).

* * By Decree of October 25, 1939, the regulations for the preservation of natural sites and in particular the following:—

(1) The Law of June 26, 1935, relative to the protection of natural sites [see this *Bulletin*, 1935, No. 10, p. 226].

(2) The Decree of October 31, 1935, relative to the application of the aforesaid Law [see this *Bulletin*, 1936, No. 1, p. 7].

(3) The Decree of March 18, 1936, relative to the protection of wild animals and plants [see this *Bulletin*, 1936, No. 7, p. 147].

(4) The Decree of March 17, 1937, relative to the ringing of birds, are made applicable to Sudetenland. (*Ämtliche Pflanzenschutzbestimmungen*, 1. Dezember 1939, Nr. 7, S. 173-174).

**. By Decree of October 26, 1939, the Clauses of the Decree of October 29, 1937, referring to the control of the pests and diseases of fruit trees [see this *Bulletin*, 1938, No. 5, pp. 100-101], come into force in the Ostmark (formerly Austria) and in the Sudetenland. (*Ibid.*, S. 173).

**. By a ministerial order of November 4, 1939, based on the Decrees of March 28, 1929 and September 30, 1932 [see this *Bulletin*, 1929, No. 6, p. 83, and 1932, No. 12, p. 205] which aim at preventing the introduction of carnation leaf roller [*Tortrix pronubana*], the importation of carnations (cut flowers) is permitted after November 15, 1939. (*Nachrichtenblatt für den Deutschen Pflanzenschutzdienst*, Anfang Dezember 1939, Nr. 12, S. 108-109).

**. By Ordinance of November 21, 1939, the president of the Biological Institute (Biologische Reichsanstalt für Land- und Forstwirtschaft), Berlin-Dahlem, is authorised to consider requests to import plant and vegetable products and to make the necessary decisions on the subject. The Minister of Agriculture however reserves the right to deal with the most important cases.

The Ordinance also covers the importation of vines, dealt with in the Decree of December 23, 1935, [see this *Bulletin*, 1936, No. 4, pp. 79-80] which set up rules for the Law on grape phylloxera control. (*Ämtliche Pflanzenschutzbestimmungen*, 1. Dezember 1939, Nr. 7, S. 172).

Germany (Protectorate of Bohemia and Moravia). — By Decree No. 137 of April 28, 1939 the destruction of *Berberis vulgaris* and *Mahonia* [B.] *Aquifolium* is made compulsory.

The necessary work must be carried out by the tenant or proprietor of the land at his own expence or, if he refuses to do so, it will be carried out by the local authorities the cost still being chargeable to him.

The destruction must be thorough, it is recommended that the plants be grouted out by the roots and burnt at once.

Exemptions may be granted by the Minister of Agriculture, however, in such a case the person concerned is expected to watch the plants spared carefully and to notify at once any symptom of fungus attack that may be observed. (*Ämtliche Pflanzenschutzbestimmungen*, Berlin, 1. Dezember 1939, Bd. XI, Nr. 7, S. 178-180).

**. By Decree No. 143 of May 19, 1939, the destruction of wild hop bines (*Humulus lupulus*) is made compulsory in the communes recognized officially as producers of hops and in neighbouring communes.

The necessary work must be carried out by the land owner or the tenant and, if not carried out by them, it will be done by the local authorities but at the expense of the person concerned.

The plants must be pulled out by the roots unless too much damage to the crop invaded by the wild hops would be caused by such methods. In such a case it will be necessary to destroy only the aerial part of the weed.

The Plant Protection Station at Praag and Brünn are entrusted with the technical supervision of the application of the above measures in Bohemia and Moravia.

The delegates of the central organisation that determines the condition of the hop crops, those of the local hop growers organisations and the officers of the Plant Protection Stations mentioned above will examine crops in order to detect stools of wild hop. They will invite the owner of the land to be present when they carry out their inspection but it may also take place in his absence. (*Ibid.*, S. 180-183).

* * By Ordinance No. 186 of July 20, 1939, relative to hop downy mildew (*Pseudoperonospora humuli*), which is valid in all communes where hops are grown, the landowners and tenants are bound to control the disease effectively, they must:—

(a) Cut out and destroy the young shoots of plants attacked by downy mildew;

(b) Provide pickets of at least 1 m 50 and bind the hop shoots up them when these are at a suitable stage of development;

(c) Remove, as soon as possible after picking, and in any case before the leaves yellow, all the old bines remaining in the hop garden. They should then be disposed of in such a way that all risk of infection is avoided;

(d) The bines should be treated with fungicidal sprays (*Ibid.*, S. 183-186).

* * By ordinance No. 205 of August, 1939 hunters are asked to confirm to certain specified rules. (*Ibid.*, S. 185-187).

Germany (Prussia). — By Decree of September 29, 1939, coming into force October 14, 1939, the control of the winter moth and the mottled umber moth [*Chematobia brumata*, *Hibernia defolearia*] is made compulsory in certain districts of the province Silesia.

Hard fruit and stone-fruit trees, with the exception of peach trees, must be provided with grease bands which remain adhesive for three months. The trees must be banded before October 15 each year and the bands removed and burnt before March 15 of the subsequent year. The portion of the trunk covered by the band must be treated with carbolineum (tar oil).

An annexe to the Decree contains detailed regulations for the application of the grease bands. (*Amliche Pflanzenschutzbestimmungen*, Berlin, 1. Dezember 1939, Bd. XI, Nr. 7, S. 176-178).

Germany (Thuringia). — A Notification of October 12, 1939, modifying the provisions of the Notification of February 17, 1939 [see this *Bulletin*, 1939, No. 7, p. 161], allows the cultivation of the following varieties of potatoes, which are not resistant to wart disease [*Synchytrium endobioticum*], in the year 1940: 'Erstling', 'Industrie' and 'Zwickauer fruhe Gelbe'. This permission however, does not apply to certain communes specifically mentioned (*Ämtliche Pflanzenschutzbestimmungen*, Berlin, 1. Dezember 1939, Bd. XI, Nr. 7, S. 178).

Chili. — The Decree No. 629 of September 27, 1939, modifies the Decree No. 105 of February 11, 1925, which contains regulations relating to the Decree-Law No. 177 of December 31, 1924, which concerns the phytosanitary police. The modification governs the amount of dodder seeds that may be tolerated in lucerne and clover seed. (*Diario Oficial de la Republica de Chile*, Santiago, 18 de octubre de 1939, año LXII, núm. 18, 492, pág. 2774)

Great Britain. — An Act of July 28, 1939, which may be cited as the Prevention of Damage by Rabbits Act, 1939, makes provision for the prevention of damage by these rodents and amends the Law relating to the use of poison and the use of spring traps above ground for the purpose of killing hares or rabbits.

This Act shall not extend to Scotland, to Northern Ireland or to the administrative county of London (*Prevention of Damage by Rabbits Act, 1939* 2 & 3 Geo. 6. Ch. 43, London, 1939, 6 pp.)

Italy. — Two Ministerial Decrees of October 5 and 7, 1939, declare the communes of Ripatransone, Massa Fermana and Falcione, Province of Ascoli Piceno, to be infested with grape phylloxera (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 18 ottobre 1939, anno 80°, n. 244, p. 4885).

** By two Ministerial Decrees of October 19 and 21, 1939, the communes of Monterubbiano, Province of Ascoli Piceno, and Serrone, Province of Frosinone, are declared to be infested with grape phylloxera. (*Ibid.*, 31 ottobre 1939, n. 254, p. 5062).

** The Ministry of Agriculture and Forests has published a list of the communes in the Kingdom that were declared to be, or suspected of being, infested with grape phylloxera on December 31, 1939 (*Bollettino Ufficiale del Ministero dell'Agricoltura e delle Foreste*, Roma, 21 dicembre 1939, anno XV, n. 33, pp. 2775-2792).

Morocco (French Zone of). — By Vizirial Decree of October 16, 1939, (2 ramadan 1358) relative to the measures for the control of the pink cotton bollworm (*Platyedra gossypiella*) and the spiny bollworm (*Earias insulana*), everyone engaged in cotton-growing, for any purpose whatsoever, is required to burn all stalks, leaves, bolls, unharvested seed, and any other cotton plant trash remaining on the fields. This operation must be carried out on the fields

immediately after harvesting and, at the latest, prior to a date which will be fixed each year by Decree of the Director General of the Economic Services.

Land under cotton the previous year should be kept in good condition, and in particular, kept free from plants of the family Malvaceae.

On no account must cotton plant trash, especially plants, stalks, leaves, bolls and seed, be taken away from the cotton fields.

Cotton must be ginned before April 1 of the year following harvesting. A Decree of the Director General of the Economic Services will indicate the date on which this measure will come into force.

In the ginneries, cotton plant trash and waste accumulating during ginning and also sweepings, must be carefully collected and burnt immediately.

Only ginned and baled cotton, baled lint and treated seed may be dispatched outside the ginnery, and no other cotton, seed, waste and sweepings.

Cotton seed must be treated with heat, this operation to be carried out immediately after ginning.

The necessary apparatus for this purpose must be installed in each ginnery.

The seeds must be treated at a temperature of at least 55° C. and for a period not less than five minutes.

The apparatus must be provided with an automatic regulator and a thermometer for daily recording.

The seed must be packed in sacks as soon as removed from the apparatus and, while still hot, the sacks must be closed and sealed.

With the exception of treated seed kept in sealed bags and compressed baled cotton and lint, which may be stored in the ginneries, the storage and transport of ginned cotton, and lints not pressed or baled, unginned cotton, and untreated seed after April 15 of the year following harvesting are prohibited. (*Bulletin Officiel*, Rabat, 20 octobre 1939, XVIII^e année, n° 1408, p. 1618).

* *. A Decree of the Director General of the Economic Services, dated October 16, 1939, relative to the regulation of cotton seed production and distribution, establishes that seed producers shall comply, *inter alia*, with the measures proposed by the Government authorities, particularly in regard to the certification of their crops and the seed obtained. This certification depends chiefly on the healthy and clean condition of the crops, on the quality and germinative power of the seeds.

The certified seeds, after having been checked for quality at the Centre for Agricultural Research, will be issued to the official associations for disinfection and for distribution to the European and native planters. (*Ibid.*, p. 1619).

Union of South Africa * — With a view to preventing the distribution of the bacterial blight of vines (*Bacillus vitivorus*) into the Union, Proclamation No. 50 of March 14, 1939, withdraws the exemption of vines in certain di-

* From a communication of Mr. C. P. VAN DER MERWE, Chief Inspector, Plant Regulatory Service, Division of Plant Industry, Department of Agriculture and Forestry, Pretoria, Union of South Africa.

stricts in the Province of the Cape of Good Hope from the restrictions on the removal of plants, prohibits the removal of vines or parts thereof infected with *B. vitivorus*, and prohibits the removal of vines or other plants of the family Vitaceae or parts thereof within or out of the districts of Somerset West, Stellenbosch, Worcester and Wynberg, except with the written permission from an officer of the Department of Agriculture and Forestry.

Government Notice No. 366 of March 17, 1939, withdraws the exemption from registration of vine nurseries in the districts referred to above and Government Notice No. 367 of same date required the registration of vine nurseries in these same districts before April 15, 1939.

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INTERNATIONAL BULLETIN OF PLANT PROTECTION

DISCOVERIES AND CURRENT EVENTS *

GERMANY

The Colorado Beetle Situation in 1939 †

The presence of the Colorado beetle (*Leptinotarsa decemlineata*) was established, during the course of the year 1939, in 12,206 places (14,128 places in 1938) in 2 381 communes ('Gemeinden') (2,510 communes in 1938) belonging to 170 different districts ('Kreise'). In 16 districts which were reported as being infested with the insect in 1938 no beetles were found in 1939.

The following table shows the distribution of the infested communes —

PRUSSIA

Rhine Province —

District of Aachen	63 communes
of Dusseldorf	26 ,,
of Koblenz	230
of Köln	38
of Trier	259

Hessen-Nassau Province —

District of Kassel	30 communes
of Wiesbaden	192

Westphalia Province

District of Arnsberg	11 communes
of Minden	2 ,
of Münster	4

Hanover Province —

District of Lüneburg	4 communes
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BAVARIA

District of Palatinate	377 communes
of Lower Franconia	34 ,
of Middle Franconia	1 ,,

* Under this and the next heading the countries are arranged in French alphabetical order.

† Communication from the Biologische Reichsanstalt für Land- und Forstwirtschaft Berlin Dahlem, official correspondent of the Institute.

WURTTENBERG.

91 communes

HESSE.

249 communes

BADEN.

District of Freiburg	322 communes
„ of Karlsruhe	107 „
„ of Konstanz	82 „
„ of Mannheim	66 „

SAARLAND.

193 communes

51,491 beetles were found (47,772 on plants and 3,719 in the soil), 25,225 clusters of eggs, 1,002,240 larvae (960,757 on plants and 41,483 in the soil), and 13,959 nymphes.

The first adults were discovered on April 7 on a farm at Dossenheim, district of Heidelberg and on April 10 in a place near Dortmund. The Colorado beetle was also observed on April 22, 23 and 28 in Palatinate and Saarland, in each case however it was only a question of a single adult on the surface of the ground or in the soil but from May 20 onwards the number of observations increased.

The first egg-laying was recorded on May 30 at Mechtersheim, district of Speyer.

The first larvae were found at Bollendorf, district of Bitburg on June 5 and 6, on plants and on June 22, in the soil.

The first nymph was seen on June 25 at Weinheim, district of Mannheim.

The first adults of the new generation were discovered July 10 at Schifferstadt, district of Speyer.

The last adults were observed on November 13

GREECE

Control of the Olive Fly *

As in former years, the control operations against the olive fly (*Dacus oleae*) were carried out during 1938 in the olive-growing districts where the expected harvest warranted the expense.

Number of Trees Treated.

In general, operations were only carried out in the districts or parts of these where olive production was 30 per cent. higher than the average yield.

* Communication from the official correspondent of the Institute, Mr A. AYOUTANTIS, Chief of the Phytopathological Service, Ministry of Agriculture, Athens, Greece.

Following this principle, control was undertaken in the following Departments and on the number of trees indicated:—

Departments	Number of Trees
Aetolia and Arcanania	324,000
Argolis and Corinth	540,000
Arta	139,000
Attica and Boeotia	995,000
Achaia	466,000
Zante	590,000
Ellis	610,000
Heraklion	2,500,000
Thesprotia	150,000
Cavalla	850,000
Corfu	2,010,000
Cephalonia	755,000
Iaonia	1,534,000
Iassithi	2,494,000
Messenia	4,300,000
Preveza	630,000
Rethymno	1,000,000
Samos	550,000
Phthiotis and Phocis	585,000
Canea	3,200,000
Chios	580,000
Total	26,500,000

A total of 26,500,000 trees treated out of approximately the 60,000,000 olive trees in Greece.

Control Method Employed.

The method employed in the control of *D. oleae* is to spray the trees with a small quantity of a mixture containing 10-15 % of cane molasses, 2.5 % sodium arsenite and 5 % ammonium sulphate.

General instructions for control operations were given by the Phytopathological Service of the Ministry of Agriculture. These instructions were sometimes slightly modified according to the local conditions of each region.

In past years, it was noted that spraying with the molasses-arsenic mixture, especially repeated spraying (as in the case of trees growing near *Dacus foci*) caused scorching of the leaves and fruits and thus more or less heavy damage. With a view to eliminating this disadvantage, bundles of branches of *Schinus* or other plants are hung on the olive trees which require repeated treatment, and spraying is carried out on these bundles instead of directly onto the foliage of the tree.

One point on which control efficacy depends is the exact date when spraying should be carried out and in which localities.

In order to ascertain date and locality, glass traps were hung on the olive trees, in the proportion of one trap to every 50 to 200 trees as required.

In the trap, a liquid was placed which attracts the *Dacus*, such as the molasses-arsenic mixture with 5 parts per thousand sodium arsenite and 5 parts per thousand ammonium sulphate.

In some districts, a simple solution of 5 per cent ammonia in water was used. In many districts, it was preferred to the molasses-arsenic mixture which makes the traps very difficult to clean.

Every five days the number of *Dacus* individuals caught in the trap are counted and the mixture renewed.

From the absence or presence of the *Dacus* in the traps and the number found, the Chiefs of Section knew when to begin operations and which localities required treatment.

Organization of Control Operations

(1) General instructions were given by the Phytopathological Service of the Ministry of Agriculture.

(2) The whole country was divided into 4 regions, each controlled by an inspector general who supervised the execution of the instructions given by the Ministry.

(3) In each Department, the Director of the district agricultural bank was in charge of *Dacus* control operations.

(4) The Department was subdivided into several inspection areas, one per province. The Chief of the Agricultural Service of the province supervised control operations in the inspection area in his province.

(5) Each inspection area was subdivided into several sections (from 2 to 5), with a maximum of 200,000 trees per section. Either an agricultural engineer or a graduate in agriculture, having had previous instruction in *Dacus* control, was placed in charge of control operations in each section.

(6) Each section comprised an average of five 'work-yards', a maximum of 40,000 trees being assigned to each.

Each work-yard was manned by of 8-10 workmen for spraying and those necessary for preparing the mixture used (1 workman and 1 assistant), transporting the mixture (2 workmen with 2 draught animals), for the eventual preparation and placing of the bundles of branches (number of workmen variable) and for attaching, washing, etc. the traps (1 workman with a draught animal and a child for hanging the traps on the trees).

Quantity of Material Employed in Control Operations.

Cane molasses	3,161,784	Kg.
Sodium arsenite	64,658	"
Ammonium sulphate	115,784	"
Sprayers	5,671	"
Glass traps	146,515	"

Cost of Control Operations.

Value of the material and apparatus employed or spoilt, including transport expenses	14,187,500	drachmae
Travelling expenses of employees (general inspectors, directors of control operations, inspectors)	1,901,200	„
Travelling expenses of chiefs of section (agricultural engineers or others)	2,593,500	„
Workmen's salaries	22,115,400	„
Other expenses	884,900	„
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Total	41,682,500	drachmae

The money required for control operations was advanced by the Central Bank of Agriculture, Animal Husbandry and Forests and recovered by means of a tax levied on olive production in the Departments where control was carried out.

This tax amounted to 1 drachma 50 per oka (1.25 kg.) of olive oil produced and 1 drachma per oka of table olives exported.

Technical Staff and Workmen Employed in Control Operations.

General inspectors for technical supervision	4
General inspectors for administrative supervision	2
Directors in charge of control operations (one in each Department)	21
Inspectors	51
Chiefs of Section	171
Workmen:---	
(a) Overseers	795
(b) for preparing the mixture	795
(c) for spraying	8,000
(d) for preparing the bundles of branches	500
(e) for attaching, washing, etc. the traps	1,650
Total	11,740

Gain Resulting from the Measures Taken Against the Olive Fly.

With a view to ascertaining approximately the gain obtained through the control measures taken against *Dacus*, the managers of the district agricultural banks were requested to give information on the following points:—

(a) The quantity of olive oil and table olives produced in the districts where control operations were carried out.

(b) The quantity of oil and olives which, in their opinion, would have been produced in these districts if control measures had not been taken, taking into consideration the yields of the neighbouring districts having the same conditions but not carrying out *Dacus* control.

(c) The depreciation in the price of olive oil and olives because of *Dacus* attack, if control measures had not been taken, taking into consideration other factors, as in (b).

The results of this enquiry are summarized in the following table:—

	Oil			Olives			In millions of drachmae
	Metric tons	Price per kg (drachmae)	Value in millions of drachmae	Metric tons	Price per kg (drachmae)	Value in millions of drachmae	
Yield obtained and its value	61,955	20	1,239	17,082	8	136.6	1,375.6
Approximate yield if <i>Dacus</i> control measures had not been taken	45,819	17 ½	801.8	14,500	4 ½	65.3	807.1
Gain	-	—	—	-	—	—	508.5

Experiments for the Improvement of Control Methods.

As *Dacus* control is of primary importance for Greece both as regards the expenses involved and the resultant gain obtained, the Ministry of Agriculture decided last year to carry out extensive experiments with a view to supplementing the available information on the biology of the insect in Greece and also to improving the control method employed by ascertaining which sweet substances and ammoniacal salts were the most suitable for attracting *Dacus*, and by studying various other points regarding the material and apparatus used in control operations and organization in general.

The programme of experiments was drawn up by specialists approved by the Minister of Agriculture and carried out in four different regions of the country, viz., Island of Crete, by the Director of the Plant Pathology Station of Patras; at Amphissa, by the Director of the Plant Pathology Station of Volos; Preveza and Corfu, by a Phytopathological Inspector.

The Ministry of Agriculture placed the sum of 2,500,000 drachmae at the disposal of the Phytopathological Service for the execution of the experiments, however, only 1,500,000 drachmae were expended, as owing to the conditions of olive production in Crete and Amphissa, it was not possible to carry out the experiments to the extent envisaged in the programme arranged.

The results of these experiments have not yet been worked out as there is still a considerable amount of data to be studied.

The only definite fact that stood out during these experiments in all the regions is that sugar-beet molasses attracts the olive fly much more than the best cane molasses, when utilized as bait in the glass traps.

SOUTHERN RHODESIA

Locust Invasion, 1932-1939 *

Monthly Report No. 83. October, 1939.

During October winged swarms of the red locust (*Nomadacris septemfasciata*, Serv.) have been reported in the following districts: Marandellas, Makoni, Melsetter, Belingwe, Gwanda, Bulalima-Mangwe, Matobo, Bulawayo, Bubi, Nyamandhlovu, Gwelo, and Sebungwe.

Most of the swarms have been described as from 'large' to 'very large', and some as 'very dense'.

It is not possible to say definitely how many swarms are concerned in these reports. The total may not be more than six.

The general trend of flight appears to be southerly with an easterly element.

All specimens examined still retained their red migrating colouration and breeding will not occur for some time yet.

Some damage to wheat and trees is reported in the Melsetter district.

Monthly Report No. 84. November, 1939

Very few reports of locusts have been received during November and all refer to winged swarms of the red locust.

Nine reports have been received in all and six of these refer to districts adjacent to the eastern border, namely Darwin, Mtoko, Melsetter and Chibi. The remaining districts concerned are Charter, which is an eastern district, and Gwanda in the extreme south.

It would appear that considerably over three quarters of the Colony has been free from locusts during the month.

All but one of the swarms reported have been described as 'large' or 'very large'.

At the end of the month one sample of locusts from a swarm showed a change towards the yellow breeding colouration, with developed ovaries in the females.

No damage has been reported.

The prospects for the coming season are, at present, more favourable than in any year since the red locust commenced in 1932.

* Communication from the official correspondent of the Institute, Mr. RUPERT W. JACK, F. E. S., Chief Entomologist, Agricultural Laboratory, Department of Agriculture, Salisbury, Southern Rhodesia.

LEGISLATIVE AND ADMINISTRATIVE MEASURES

Australia (Western Australia). — On October 27, 1939, double gee (*Emex australis*) has been declared to be a noxious weed within the boundaries of the Bunbury Road Board. (*Government Gazette of Western Australia*, Perth, November 3, 1939, No. 53, p. 1964).

Australia (Queensland). — The Act No. 8 of October 12, 1939, which may be cited as 'The Pest Destroyers Act of 1939', consolidates and amends the Law relating to the regulation of the sale of insecticides, fungicides, vermin destroyers, lures, weed destroyers, and sterilisers or cleansers. (*Queensland Government Gazette*, Brisbane, 18th October, 1939, No. 91, pp. 1355-1379).

Burma * — By Department Notification No. 376 of September 4, 1939 the importation of gram [*Cicer arietinum*] into Burma is prohibited absolutely.

Chile. — Decree No. 698 of October 18, 1939 lays down measures to prevent the introduction of the causal agent of 'arrebiatado' (*Dysdercus* sp.) into the country during the transit of cotton seed via Arica (*Diario Oficial de la República de Chile*, Santiago, 4 de noviembre de 1939, año LXII, núm. 18,506, pág. 2930).

Straits Settlements. — By Ordinance No. 26 of September 11, 1939, which may be cited as the Export of Plants (Control) Ordinance, 1939, the Governor in Council may, by notice in the *Gazette*, prohibit the exportation from the Colony, or any part thereof, either absolutely or subject to such conditions as may be specified in the notice, or to any named country, territory or place, of any plant or part thereof which is capable of use for the propagation of such plant. (*Straits Settlements Government Gazette*, Singapore, September 15, 1939, Vol. LXXIV, No. 111, pp. 3813-3814)

United States of America. — Amendment No. 4 to the rules and regulations supplemental to Notice of Quarantine No. 71 on account of the Dutch elm disease [*Ceratostomella ulmi*], approved on September 6, 1939 and effective on September 11, 1939, brings under regulation for the first time, areas in Litchfield and New Haven Counties, Conn., Columbia and Ulster Counties, N. Y., and the entire county of Dutchess in New York. Extensions have been made to an area formerly under regulation in a county in Connecticut, two in New York, and five in New Jersey, placing the entire counties of Hunterdon and Mercer, N. J., and Putnam, N. Y., within the regulated area.

* From a communication of Mr. E. G. S. APEPALE, I. C. S., Deputy Secretary to the Government of Burma, Defence Department, Rangoon, to the International Institute of Agriculture.

The embargo with reference to the inter-state movement of elm material from the regulated areas is continued and restrictions have been added to limit the movement of such material from non-regulated area through regulated areas to the winter months and then only on a through bill of lading.

The Dutch elm disease has been discovered in a number of townships in Bucks and Northampton Counties, Pa. The State has placed an embargo on the movement of elm material therefrom and Federal quarantine action is withheld, thereby continuing the embargo on the movement of sources of infection from heavily infected sections of New Jersey into Pennsylvania. (*B E P Q* — *Q* 71, [Washington, D C], 1939, 2 pp.)

** Owing to the recent discovery of the pink cotton bollworm [*Platyedra gossypiella*] on okra [*Hibiscus esculentus*], by Amendment No. 1 to the revised regulations supplemental to Notice of Quarantine No. 52, approved on September 11, 1939 and effective on September 15, 1939, regulations 2, 3, and 4 are amended to add okra to the list of articles the inter-state movement of which is restricted from regulated areas. This Amendment also adds the Texas counties of Duval, Jim Hogg, La Salle, Maverick, Webb, and Zapata to the regulated areas because of the finding of new areas of infestation. (*B. E. P. Q.* — *Q.* 52, [Washington, D C], 1939, 3 pp.).

** Additional infestations of the pink cotton bollworm [*Platyedra gossypiella*] having recently been located in Texas, the regulated area is further extended by Amendment No. 2 to the revised regulations supplemental to Notice of Quarantine No. 52, approved on September 23, 1939 and effective on September 25, 1939, to include the Texas counties of Dimmit, Frio, and Zavala, all lightly infested and all contiguous to former regulated area.

Amendment No. 1 approved on September 11, 1939 and effective on September 15, 1939 is superseded. (*B E P Q* — *Q.* 52, [Washington, D C], 1939, 3 pp.).

Greece * — By Royal Decree of April 5, 1938 the Island of Lannos is declared infested with grape phylloxera.

By Royal Decree of December 22, 1939, the Department of Larissa, with the exception of the Zagora region, is declared to be infested with phylloxera. The outside limits of the uninfested zone are given.

Italy. — By Royal Decree No. 2054 of September 22, 1939, an Agricultural Section of technical Institute of the Royal Agronomic Institute for Italian Africa is set up [see this *Bulletin*, 1939, No. 4, p 85, and No. 5, p 112]. This Section will specialise in colonial agriculture and train agricultural technicians for the Colonies.

* Communication from the official correspondent of the Institute, Mr A. AYOUTANTIS, Chief of the Phytopathological Service, Ministry of Agriculture, Athens, Greece.

Amongst the educational subjects taught at the above Section the diseases of colonial plants and zoology with special reference to colonial agriculture will be included. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 24 gennaio 1940, anno 81^o, n. 19, pp. 316-317).

Jamaica. — The Law No. 21 of June 19, 1939, which may be cited as the Banana (Leaf Spot Control) Law 1939, affords assistance to the banana industry for the treatment of *Cercospora* leaf spot of bananas (*Cercospora musae*), and creates by means of a cess a reserve fund for the relief of the said industry. (*Jamaica Gazette Supplement*, August 3, 1939, Vol. LXII, No. 20, pp. 483-494).

Luxemburg (Grand Duchy of). — By a Decree of May 11, 1939 all land-owners, tenants, farmers or occupiers of land, by whatever title, who have discovered the presence of the Colorado beetle (*Leptinotarsa decemlineata*) on their land, no matter what crop is being grown or in what form the insect is discovered, egg, larva nymph or the perfect insect; are bound to make an immediate declaration to that effect to the burgomaster of the commune wherein the land is situated.

The burgomaster must then at once inform the Minister of Agriculture at Luxemburg by telegram.

The occupier, whatever his title to the land, discovering the presence of the Colorado beetle is bound to ensure its destruction by applying one of the following treatments:—

(a) For field crops:— The infested crop should be sprayed with 5 per cent. calcium arsenate or diplumbic arsenate. These insecticides should remain in suspension for the length of time necessary to carry out the treatment and should, further, fulfil the following conditions:—

Calcium arsenate: As. 25 ± 0.5 % minimum.
Soluble $As_2 O_5$ maximum 1.5 %.

Diplumbic arsenate: $As_2 O_5$ minimum 30 %.
Soluble $As_2 O_5$ maximum 0.5 %.

For lead arsenate pastes, all these requirements are reduced by 50 per cent.

(b) In gardens:— The infested crop should be treated with a derris or similar preparation containing 0.75 per cent. of rotenone.

Infractions of this Decree will be punished as laid down in Article 3 of the Law of March 15, 1892, dealing with the destruction of insects and plants harmful to agriculture.

At all times, the movement or maintenance of living Colorado beetles for whatever purpose is prohibited. Exceptions to this rule may be made by the Minister of Agriculture in connection with scientific work.

The transport of potatoes or other solanaceous plants, for whatever purpose, from land infested or suspected of being infested with Colorado beetle is prohibited.

The officials of the Plant Improvement Commission and the Phytopathological Service and persons acting on their instructions are to supervise the enforcement of this Decree.

In the case of neglect to carry out the measures laid down in this Decree within a reasonable time or neglect to carry them out at all, the necessary work will be carried out on the responsibility of the burgomaster or a person appointed by him for the purpose, but at the expense of the delinquent, in accordance with the provisions of Article 4 of the Law of March 15, 1892.

The Ministerial Decree of February 27, 1936 [see this *Bulletin*, 1936, No. 7, pp. 157—158] relating to the control of the Colorado beetle is repealed (*Mémorial du Grand-Duché de Luxembourg*, Luxembourg, 13 mai 1939, N° 37, p. 414-415).

Morocco (French Zone of). — By Decree of September 12, 1939, the Decrees of December 30, 1938, and July 6, 1939 [see this *Bulletin*, 1939, No. 4, p. 86, and No. 11, p. 265] permitting the destruction of rabbits in the Rabat region and the territory of Port-Lyautey are repealed. (*Bulletin Officiel*, Rabat, 22 septembre 1939, XXVIII^e année, N° 1404, p. 1497).

* * With regard to the control of the pink cotton bollworm [*Platyedra gossypiella*] and the spiny bollworm of cotton [*Earias insulana*], a Decree of January 8, 1940, lays down that the destruction of the stems, bolls, unharvested seed and in short all debris of the cotton plant must be completed before February 15, 1940. (*Ibid*, 19 janvier 1940, XXIX^e année n° 1421, p. 115).

New Zealand. — By Special Order made by the Awatere County Council on October 5, 1939 and published by the Minister of Agriculture on October 30, 1939, variegated thistle (*Silybum marianum*) is declared to be a noxious weed in the Awatere County. (*The New Zealand Gazette*, Wellington, November 2, 1939, Numb 134, p. 3012).

Nyasaland. — By the Tobacco Pest Rules, 1939, published by Government Notice No. 44 of July 3, 1939, an officer may, at any reasonable time, enter into and inspect any building, factory, place or vehicle and may examine any article or receptacle used for the purpose of curing, storing, manufacturing, transporting or in any way connected with the handling of tobacco or other agricultural product for the purpose of ascertaining the presence or otherwise of a pest of tobacco (*Lasioderma serricornis*, *Ephestia elutella* and such other insect organisms or plant disease which the Governor may, by notice in the *Gazette*, declare to be a pest of tobacco).

It shall be an offence against these Rules for any person owning or having control of any building, factory, place, vehicle, article, or receptacle, whatsoever, used for the purpose of curing, storing, manufacturing, transporting or in any way connected with the handling of tobacco or other agricultural product, to fail to keep such building, factory, place, vehicle, article or receptacle free from a pest of tobacco.

An officer may direct any person owning or having control of any building, factory, place, vehicle, article, or receptacle to take such measures as may be necessary for the extermination of a pest of tobacco or to prevent it spreading,

or may himself take such measures as he may deem fit, at the owner's expense, for the eradication of the pest; and in so doing he may order the immediate destruction without compensation of any tobacco or other agricultural product whether in transit or otherwise. (*Supplement to The Nyasaland Government Gazette*, Zomba, 10th July, 1939, Vol. XLVI, No. 24, pp. 51-52).

Réunion. — To avoid the danger arising from the introduction into the Island of cassava [*Manihot*] from regions where the plantations are attacked by mosaic disease, the importation, circulation, warehousing and transit of cassava plants, cuttings and seed from whatever country is prohibited by a Decree of the Minister for the Colonies dated February 5, 1940.

Exceptions may be granted in special cases for the introduction of cassava plants, cuttings or seed from any country by a decision of the Minister for the Colonies on a recommendation from the Governor of Réunion. Such a decision will determine the conditions under which the importation may take place and will specify the quantity of plants, cuttings or seeds that may be imported.

Exceptions will only be granted for plants, cuttings or seeds, the importation of which is considered to be of a real technical or economic value.

All plants, cuttings or seeds admitted under such an exception may only be forwarded by official channels and the cost of transport must be refunded by the importer.

Authority to import, circulate or warehouse or even for transit across Réunion can only be granted by the Customs Office at Pointe-des-Galets on production of the ministerial permit for importation. It is only granted on production of a certificate as to the condition of the plants from the phytopathological service of the country of origin and after examination by an official of the Agricultural Service showing the products to be healthy and free from any parasites.

Every suspect lot is to be siezed and burnt at once and at the expense of the importer.

Every lot admitted will enter into the charge of the Agricultural Service which will cultivate them in quarantine in the Botanical Garden at Saint-Denis and keep them under observation for 15 months.

If a plant shows signs of disease during the quarantine period, all the plants from the same consignment and of the same variety will be uprooted and burnt without compensation to the importer.

Plants released from quarantine will be cultivated by the importers in a place sanctioned by the Agricultural Service and placed under the supervision of the Service during a further period of 15 months.

No cutting may be taken from the plants without permission of the Agricultural Service.

Any lot including a diseased plant must be uprooted and burnt without any compensation to the owners. (*Journal officiel de la République française*, Paris, 16 février 1940, LXXII^e année, n° 46, p. 1190).

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INTERNATIONAL BULLETIN OF PLANT PROTECTION

DISCOVERIES AND CURRENT EVENTS *

ARGENTINE REPUBLIC.

Invasion of the South American Locust †

At the beginning of June 1939, the position with regard to the invasion of the South American locust (*Schistocerca paranensis*) was as follows:—

The last nymphs left in the provinces of Salta, Tucumán, La Rioja, Córdoba and the Territory of Formosa are changed into adults. Swarming was not serious and occurred only in the provinces of Salta, La Rioja and Córdoba.

In the middle of the month a swarm, 20 square kilometres in extent, left Córdoba and invaded the forest zone of San Javier, department of San Javier and entered the province of San Luis and infested the district of Merlo, department of Junín. After staying several days it returned in the direction of Córdoba.

The swarm formed at Salta was seen in the departments of Rosario de la Frontera and Candelaria moving southwards. At the end of the month, the province of San Luis was again invaded by a swarm coming from the north-west (Córdoba) and extending over 25 square kilometers. In the province of Tucumán the passage of a swarm coming from the North was recorded (Salta). It followed a southeasterly direction and penetrated into the province of Santiago del Estero leaving compact groups in the department of Burruyacu; afterwards the Territory of Formosa was invaded by a considerable swarm coming from the north and extending 25 kms. in width and 10 in length. This last swarm, after passing Ing. Juarez, department of Bermejo moved away towards the south.

The winged insects of the province of La Rioja, forming a belt of 9 square kilometres, massed in the departments of Gobernador Gordillo and Rivadavia. They caused no damage as control measures were effective.

In July these swarms continued their movements regularly as the temperature allowed, thus they invaded the province of Catamarca, department of La Paz over an area of 10 square kilometres. This invasion came from Santiago del Estero.

* Under this and the next heading the countries are arranged in French alphabetical order.

† Communication from Mr. JUAN F. TOMASELLO, Agricultural Engineer, Director of the 'Defensa Agrícola', Ministry of Agriculture, Buenos Aires, Argentine Republic

On August 8 at 4 p. m. a considerable swarm, though not very dense, passed the district of Zapallar, department of Tobas in a southerly direction; owing to a change of weather it changed its direction and was driven into the forest region of the same department by the south wind.

Several days later, August 18, some of the adults from the province of Córdoba passed into the province of Santa Fé where a swarm of 250 square kilometres penetrated into the department of San Martín. In its southerly course the swarm passed the departments of Iriondo, Belgrano, Caseros, Constitución, and General Lopez. It penetrated the province of Buenos Aires, via Colón, in a column of 50 square kilometres front.

The first oviposition was noted on September 14 in the department of Caseros, Province of Santa Fé, district of Arequito.

Invasion by the adults proceeded as follows in the places named.

Province de Santa Fé. — The adults infesting the districts of San José de la Esquina, Los Nogales, Arequito, Villada, Chabas, Los Quirquinchos, department of Caseros, Bombal, department of Constitución, Firmat, Cañada de Ucle, Sancti Spiritu and Maggiolo, department of General Lopez did considerable egg-laying.

Province de Córdoba. — An invasion of adults extended over an area of 800 square kilometres in the department of San Justo, Santa Maria, Rio 1° and Rio 2° and egg-laying took place in most districts in this region. Fewer eggs were laid in the departments 3° Arriba and 3° Abajo and in the departments of Calamuchita and Juarez no considerable oviposition was left.

Destruction of *Schistocerca paranensis* from June 1, to September 30, 1939.

Provinces	By dusting				By flame throwers, barriers, etc.			
	Adults		Adults and nymphs		Adults		Nymphs	
	Kg.	Ha.	Kg.	Ha.	Kg.	Ha.	Kg.	Ha.
Buenos-Aires . .	25,020,000	2,686	—	—	—	—	—	—
Santa Fé	(a) 70,321,000	7,663	—	—	—	53	—	—
Córdoba	(b) 28,142,000	1,763	—	—	35,300	—	—	—
La Rioja	654,000	109	1,278,000	213	—	—	—	—
Salta	6,400,000	690	—	—	—	—	6,000	1
Tucumán	2,400,000	160	—	—	—	—	6,000	—
Totals	132,937,000	13,071	1,278,000	213	35,300	53	12,000	1

(a) By dusting from aeroplanes 16,700,000 kg. of adults were killed over an area of 1,820 hectares.

(b) Similarly 13,140.00 kg. of adults were killed over an area of 256 square kilometres using dusts scattered from aeroplanes.

Province de San Luis. — In this province the adults were distributed over an area of 100 square kilometers in a mountainous zone in the district of Saladillo, department of Coronel Pringles.

Province de Buenos Aires. — The invasion of insects in egg-laying condition was followed by the invasion of the districts of La Pinta, department of General Arenales and of El Arbolito (Colón) but oviposition did not commence.

GREECE.

Scale Insects Observed on Citrus Trees in the Islands Skiathos, Skopelos and Sakiz-Adasi *

A communication on the scale insects observed in Krete was published in this *Bulletin*, 1940, No. 1, pp. 2-4; as a sequel to this the results of the research of Dr. Jean Koroneos on the same subject carried out in the islands Skiathos, Skopelos and Sakiz-Adasi (Chios) are given below.

I. — SKIATHOS AND SKOPELOS.

Aonidiella aurantii. This is the most common species in Skiathos and Skopelos. It was observed in the small Islands Tsougria near Skiathos.

Lepidosaphes pinnaeformis. This species was found unexpectedly in Skiathos and there only on the property of Mr. B. Kantaraki by the bay of Kolios, it was doubtless introduced with citrus trees or cuttings.

Lecanium hesperidum.

Saissetia oleae.

Pseudococcus citri.

II. — SAKIZ-ADASI.

Aonidiella aurantii. Very abundant everywhere and causing much damage.

Lecanium hesperidum.

Saissetia oleae.

Pseudococcus citri. Causing much damage in certain districts.

Icerya purchasi.

* * *

Chrysomphalus dictyospermi. This scale insect was found in none of the three above mentioned islands.

* Communication from the official correspondent of the Institute, Mr. A. AYOUTANTIS, Chief of the Phytopathological Service, Ministry of Agriculture, Athens, Greece.

LUXEMBURG.

The Colorado Beetle Situation during 1939 *

In the course of the year 1939, 238 declarations were received which represents the same number of foci of *Leptinotarsa decemlineata*. The two first finds were at Schiffingen and Obercorn on April 10 and 18 respectively. The insects were not found on potatoes and were, undoubtedly, emerging from hibernation on account of the warm weather and had already reached the surface of the soil.

From June 1 to 13 only scattered foci appeared, then their number increased rapidly and afterwards decreased again.

During August only scattered foci were found. The very important focus at Monnerich, found on September 20, was only discovered when the potatoes were harvested though it must have been in existence some time before.

In 1939, the northerly part of the country (the Ardennes region) was hardly attacked at all, though in the previous year many foci were found there. In the Ardennes the Colorado beetle was found only at Wahl and Bowen. The foci of 1930 were caused by flights of the insect which may re-occur each year when the wind and weather conditions are favourable.

Similarly, in 1939, the majority of the foci were found in soils that are light or sandy such as those of the sandstone and jurassic sands, the alluvial sands along the water courses (Moselle, the lower Sure, Alzette, Eisch, and Attert), as well as in the well cultivated garden soils such as, for example, those of the market gardening region of Esch. This may be explained by the fact that light soil is more favourable to the hibernation of the insects because they can penetrate more easily and deeply and so escape the winter cold.

The invasion has made great progress in comparison with 1938.

The number of foci was hardly increased but the extent of each one of them was considerably greater. In 1938 a large number of foci did not much exceed two square metres, in 1939 on the other hand, many covered whole fields and, not seldom, whole plains were infested.

For the first time the onus of Colorado beetle control measures was on the potato cultivators in 1939, the State having undertaken it again in the previous year. The control measures are regulated by the Decree of May 11, 1939, and in most cases the prescribed measures were carefully carried out.

After a declaration of the discovery of a focus of the insect, the fact that control measures are taking place was verified. The cost of the control measures was borne by the State exclusively and the practical instructions given by the staff to the cultivators was of great value.

This year again, no important damage due to the Colorado beetle was recorded in the Grand Duchy of Luxemburg and it is only in a few particular cases—as for example at Neudorf—that the attack was more severe.

* Communication from Prof. M. GILLEN, Director of the State School of Agriculture, Ettelbruck, Grand Duchy of Luxemburg.

PALESTINE.

Diseases of Industrial and Medicinal Plants *

In the following a preliminary list is given of diseases occurring on industrial and medicinal plants in Palestine, as studied at the Division of Plant Pathology of the Agricultural Research Station, Rehovot, from 1923 to 1938. The author was assisted in the collection and determination of these diseases by Dr. M. Chorin, Ing. G. Minz, Dr. J. Perlberger and Dr. F. Littauer, assistants at the above mentioned laboratory.

<i>DIGITALIS PURPUREA</i> LINN.	<i>Rhizoctonia solani</i> Kühn. Withertip (non-parasitic).	Leaf petioles rot.
<i>Gossypium</i> sp. - COTTON.	<i>Rhizopus</i> sp. <i>Sclerotium bataticola</i> Taub.	Fruit wilt. Wilt.
<i>HYSSOPUS OFFICINALIS</i> LINN.	<i>Alternaria</i> sp. <i>Macrosporium</i> sp. <i>Heterodera marioni</i> (Cornu) Goodey.	Leaf spot. Leaf spot. Root knot.
<i>LINUM USITATISSIMUM</i> LINN. - FLAX.	<i>Melampsora lini</i> (Schum.) Desm. Leaf scorch (non-parasitic).	Rust.
<i>MELISSA OFFICINALIS</i> LINN. - BALM.	<i>Heterodera marioni</i> (Cornu) Goodey.	Root knot.
<i>MENTHA PIPERITA</i> LINN. - PEPPERMINT.	<i>Diplodia</i> sp. <i>Fusarium</i> sp. <i>Rhizoctonia solani</i> Kühn. <i>Sclerotium bataticola</i> Taub.	Root rot. Root rot. Root rot. Root rot
<i>M. VIRIDIS</i> LINN.	<i>Alternaria</i> sp. <i>Rhizoctonia solani</i> Kühn. <i>Heterodera marioni</i> (Cornu) Goodey.	Leaf spot. Root rot. Root knot.
<i>NICOTIANA TABACUM</i> LINN.	<i>Erysiphe cichoracearum</i> DC. <i>Fusarium</i> sp. <i>Pleospora</i> sp. <i>Pythium</i> sp. <i>Sclerotinia sclerotiorum</i> (Lib.) Mass. <i>Sclerotium bataticola</i> Taub. Crinkle, virus. Leaf roll, virus. Mosaic, virus. Ring spot, virus. Severe mosaic, Virus.	Powdery mildew. Damping off; root rot. Stem spot. Damping off. Damping off. Collar and root rot.

* Communication from the official correspondent of the Institute, Dr. I. RILCHERT, Chief Plant Pathologist, Division of Plant Pathology, Agricultural Research Station, Rehovot, Palestine.

PAPAYER SOMNIFERUM LINN. — OPIUM POPPY.	<i>Alternaria</i> sp.	Leaf spot.
	<i>Fusarium</i> sp.	Root rot.
	<i>Helminthosporium</i> sp.	Leaf spot.
	<i>Heterodera marioni</i> (Connu) Goodey.	Root knot.
SANTOLINA sp. — LAVENDER COTTON.	<i>Fusarium</i> sp.	Collar rot.
SAPONARIA OFFICINARIS LINN. — SOAPWORT.	Yellow leaf spot (undetermined).	
SESAMUM INDICUM LINN. — SESAME.	<i>Sclerotium bataticola</i> Taub.	Root rot; damping off.
VERBASCUM THAPSIFORME SCHRAD.	<i>Fusarium</i> sp.	Collar and root rot.
	<i>Rhizoctonia solani</i> Kühn.	Collar and root rot.
	<i>Sclerotium bataticola</i> Taub.	Collar and root rot.
	<i>Heterodera marioni</i> (Connu) Goodey.	Root knot.
V. 'THAPSUS LINN.	<i>Macrosporium</i> sp.	Leaf spot.

THE NETHERLANDS.

The Colorado Beetle, *Leptinotarsa decemlineata*, in 1939 *

The situation with regard to the Colorado beetle in the Netherlands was better in 1939 than in 1938 because of the absence of any important swarming.

The area which was invaded, South of the Rhine, has not, with but one exception, increased and in other places the infestation is less intense.

The number of districts (gemeenten) within which the Colorado beetle was found was 121 (161 in 1938), the number of attached foci was 58 (224 in 1938) and the number of superficial foci was 261 (607 in 1938)

The measures adopted are —

(1) Planting of plant traps at the attached foci of 1938 (with a few exceptions, these foci are on the way to being destroyed).

(2) Treating the new foci as in 1938.

(3) Examination of the crops by the cultivators and controllers.

(4) Three treatments of potatoes growing South of the Rhine with 0.4 per cent lead arsenate.

(5) Intensive control of the execution of spraying programs by 82 controllers.

(6) Propaganda by meetings and in schools, with the help of booklets and posters, etc.

* Communication from the official correspondent of the Institute, Mr. N. VAN POETEREN, Engineer, Chief of the Phytopathological Service of the Netherlands, Wageningen.

SOUTHERN RHODESIA.**Locust Invasion, 1932-1939.***

Monthly Report No. 85. December, 1939.

The position in reference to the red locust (*Nomadacris septemfasciata*, Serv.), has deteriorated appreciably during December, but remains relatively favourable as far as breeding in the European areas is concerned.

The eastern districts have been invaded by fresh swarms from Moçambique Territory, whilst locusts have apparently entered the Colony also from the north and from the west.

Districts in which swarms have been observed during the month include Lomagundi, Darwin, Mrewa, Mtoko, Melsetter, Bikita, Charter, Victoria, Chilizanji, Gwelo, Selukwe, Insiza, Matobo, Chibi, Ndanga, Belingwe, Gwanda and Nyamandhlovu. These eighteen districts compare with six districts which reported locusts during November.

Some of the swarms have been described as 'very large', one in the Charter district being estimated to have been 35-40 miles long and 15-20 miles wide. This swarm took two days to pass over one farm.

A great deal of damage to native crops has been reported in several districts and, apparently, to European crops in the Melsetter district.

Extensive egg-laying is reported, so far chiefly in the low veld or other native areas.

SWITZERLAND.**Distribution of the Colorado Beetle and Organisation of Control Measures against this Pest †**

During 1939, Colorado beetles (*Leptinotarsa decemlineata*) were first found in consignments of imported vegetables: the first to be found in the open field was reported only at the end of May. During the course of June and July, the beetle spread considerably and, at the end of June, it reached the Canton Valais again, in the beginning of July, the Cantons Schaffhouse, St. Gallen and Zug, mid-July Obwalden and at the end of July there were foci in the Cantons Schwyz and Thurgau. It should be able to be proved that the first beetles had already crossed the whole of Switzerland. The stages of development observed in the Cantons St. Gallen and Schwyz give support to the opinion that the Colorado beetles that had penetrated furthest east had been carried on the west wind at the beginning of July. Stormy and heavy weather excites the Colorado beetles to swarm and allow themselves to be carried on the wind; in west Switzerland whole swarms were directly observed.

* Communication from the official correspondent of the Institute, Mr. RUPERT W. JACK, F.E.S., Chief Entomologist, Agricultural Laboratory, Department of Agriculture, Salisbury, Southern Rhodesia.

† Communication from Dr. F. T. WAHLEN, Director of the Federal Establishment for Agricultural Experiments, Zurich-Oerlikon, Switzerland.

By the middle of August the females of the second (summer) generation had already commenced egg-laying but on account of a cold and wet autumn these insects became less active and penetrated into the ground prematurely. At the end of the year the distribution of the Colorado beetle in Switzerland was as follows:—

Cantons	Communes	Foci
Vaud	376	* 20,239
Bern	402	* 6,770
Genève	42	* 3,500
Neuchâtel	61	* 2,800
Fribourg	203	* 1,528
Solothurn	103	* 1,478
Luzern	44	886
Aargau	119	585
Basel-Land	53	319
Zurich	37	56
Valais	20	45
Basel-Stadt	3	33
St. Gallen	16	26
Zug	5	9
Schaffhausen	6	6
Thurgau	4	4
Schwyz	1	1
Obwalden	1	1
Total	<u>1,496</u>	<u>* 39,300</u>

* Not an exact census, the appearances were too transient.

In 1938, 823 communes were affected at 4479 different foci, nearly ten times so many foci were found in 1939.

There are now only five and a half cantons that are free of the Colorado beetle, Uri, Nidwalden, Glarus, Appenzell, Gränbünden and Ticino, and it must be now considered that it is a permanent member of the local fauna. Colorado beetle control must in the future take place every year and, in time, the control measures will become a normal part of work involved in potato cultivation and those who do not undertake them will learn, by reduced yields, that the recommended treatment is profitable.

In the spring the Swiss Colorado Beetle Committee made known to all the cantonal centres the methods of control tested in 1937 and 1938 and recommended internationally. These have been simplified because there is now no hope of entirely eliminating the pest. The method of eradication hitherto practiced—the fumigation of the soil with carbon disulphide—is now only used in regions where there are isolated occurrences of the insect; further, destruction of the haulms and soil sterilisation has been abandoned and protection zones where spraying is compulsory are no longer prescribed. The principal curative measures depend on a more strict organisation of the service of detection by schools and the proprietors in the regions affected. The cantonal centres organise the work of searching for the insects at the right time in collaboration with the Directors of Agriculture and Animal Breeding. The determination of the time

of the search varies, in particular with the micro- and macro-climate and the time of egg laying.

The control measures included a complete destruction of the foci discovered and the spraying of neighbouring land (20-30 ares) as a preventive measure. Further in regions where the attack was severe the communes had the right to ask for compulsory spraying within their territory ('obligation facultative'). For spraying, a mixed spray is recommended; made up of Bordeaux mixture and diplumbic arsenate, the former serving for potato blight (*Phytophthora infestans*) control and the latter for Colorado beetle (*L. decemlineata*) control.

Places where the insects were found were treated with derris powder (official) to kill any larvae falling from the branches; on land where vegetables were planted it was possible to use nothing else but this rotenone preparation.

Again this year the Swiss Confederation is supplying the necessary insecticide gratis but in the future it will only be able to make a contribution to those cultivators who are directly affected. Further a subsidy of 20 per cent. will be made for the purchase of large spraying machines for rationalised working, on condition that anti-Colorado beetle syndicates are formed and that the sprayers are put at the disposal of potato planters in the commune or within the area of the syndicate's activity at net cost. It is expected that the cantons will make a similar contribution. Cultivators in the higher districts, who of course would not be able to join an anti-Colorado beetle syndicate, will also be eligible for a subsidy for the purchase of ordinary spraying equipment.

The discovery of the presence of the Colorado beetle at whatever stage of development must be at once reported and control measures are compulsory.

LEGISLATIVE AND ADMINISTRATIVE MEASURES

Australia (Western Australia). — On November 17, 1939 caltrop (*Tribulus terrestris*) has been declared by the Lieutenant-Governor in Executive Council to be a noxious weed within the boundaries of the Mukinbudin Road Board. (*Government Gazette of Western Australia*, Perth, November 24, 1939, No. 57, p. 2085).

Belgium. — By Ministerial Decree of February 9, 1940, any grower or holder of stocks of potatoes who notices the presence of wart disease (*Synchytrium endobioticum*) in his crops or stocks must at once inform the burgomaster of the commune, the latter will then inform the Minister of Agriculture by telegram.

Tubers and haulms of potatoes harvested within a radius of 2.50 metres of the infected plant must be carefully collected and burnt on the spot or properly buried and covered with lime and a layer of soil at least 50 cms deep. The haulms of plants harvested in other parts of the infected field will be burnt on the spot.

Tubers from the same part may not be dug up or transported except with the authorization of the inspector of the Phytopathological Service who will decide the minimum area that must be considered as infected.

Potatoes for which the above authorisation is granted may only be used after being boiled whilst all pieces and debris must be subjected to the same treatment or properly buried with lime.

In places that are declared to be infected with wart disease the storage and cultivation of potatoes is forbidden for seven years; however, after the third year, varieties of potatoes that are declared to be immune may be cultivated there.

Within a radius of 500 metres of places declared to be infected with wart disease the cultivation of non-immune varieties of potato is similarly forbidden for seven years; the cultivation of varieties declared to be immune may be made after the first year following the discovery of presence of wart disease.

Special permission from the inspector of the phytopathological service is however always required when non-immune varieties are grown within three years following the discovery of the presence of wart disease.

From the eighth year onwards the land formerly infected and within the above mentioned radius of the seat of infection will be free for the cultivation of any variety of potatoes.

The removal of farmyard manure composts or liquid manure to other farms from that infected with wart disease is prohibited, except written permission be granted by the Chief of the Phytopathological Service.

The latter may extend, in certain cases, this prohibition to other vegetables the storage or cultivation of which may be a danger from the point of view of the further spreading of wart disease.

Further, he may grant exceptions to the preceeding regulations, particularly in cases involving scientific investigations or the cultivation of varieties recognised as being resistant to wart disease.

When the application of these rules causes serious damage to the exploitation of the land, the question of compensation will be in the hands of the Minister of Agriculture. (*Moniteur Belge*, Bruxelles, février 1940, 110^e année, n^o 42, p. 577-578).

France. — By Decree of December 2, 1939 an advisory committee has been set up at the Ministry of Agriculture to deal with questions concerning fertilizers, fungicides and insecticides. This committee is to give opinions on questions submitted to it by the Ministry of Agriculture, both as regards the needs of agriculture and the conditions of supply and distribution of fertilizers and parasitocides. It is particularly expected to know programmes for production, imports and exports of the materials in question. (*Journal officiel de la République française*, Paris, 5 décembre 1939, LXXI^e année, n^o 301, p. 13668-13669).

* * The members of the Fertiliser, Fungicides and Insecticides Advisory Committee set up by the Decree of December 2, 1939, are appointed by a Decree of December 16, 1939. (*Bulletin de l'Office de Renseignements agricoles*, Paris, 1^{er} janvier 1940, année 1940, n^o 1, p. 21).

Kenya. — By Government Notice No. 551 of July 28, 1939, the Governor may, by notice in the *Gazette*, prohibit the movement within the Colony of any plant or seed which is diseased or likely to spread disease, and may prohibit for any period the planting or growing of any crop or variety thereof which may be considered likely to hinder the prevention of the spread or the proper control of any disease or pest:

Every occupier or, in the absence of the occupier, every owner of land shall report to the Director of Agriculture the occurrence of any pest or disease, and shall transmit to him specimens of such pest or diseased plant

An inspector may give such instructions as he may consider necessary for:

(a) the disinfection, fumigation and treatment of any building, vehicle, aircraft or vessel suspected of being or having been used for the storage or conveyance of anything likely to infect any plant with disease or pest;

(b) controlling and/or destroying any plant which has been declared to be a pest.

Where, in any area, the Governor is of the opinion that pests or diseases cannot otherwise be readily or adequately controlled or eradicated he may, by notice in the *Gazette*, declare such area to be an infected area and thereafter no person shall move or cause to be moved any plant specified in such notice from such area without the permission of the Director of Agriculture or an officer of the Department of Agriculture authorized by him

The planting of maize in the administrative districts of Nakuru and Ravine is hereby prohibited between such dates as may from time to time be specified by the Governor by notice in the *Gazette*.

All maize stalks, roots and other residues of maize in the above named districts shall be destroyed before such date as may be specified by the Governor by notice in the *Gazette*, with the exception of such maize stalks, roots and other residues as are specifically exempted in such notice

No occupier, or in the absence of the occupier, no owner of land shall permit any maize of the description known as 'Volunteer' to grow or be grown on his land in the said districts.

If any coffee is found to be infested with an insect pest in a warehouse or coffee curing and cleaning factory, the keeper of such warehouse or coffee curing and cleaning factory shall forthwith notify the Director of Agriculture of the fact and shall state the name of the owner of the plantation from which such coffee was delivered. The Director of Agriculture or an inspector may order that the bags containing such infested coffee and any other coffee immediately in contact with it, shall forthwith be effectively treated to his satisfaction for the destruction of such pest.

All loose coffee of every description on or near any railway station, godown, cleaning mill and/or any other place where coffee may be spilled, shall be collected and roasted or burnt before the first day of the month next following the month in which it was spilled or found near such railway station, godown cleaning mill or other place

Every occupier or owner of land on which locusts (*Schistocerca gregaria*, *Locusta migratoria*, *Nomadacris septemfasciata* or any other species of the family

Acridiidae that have the swarming habit) have deposited their eggs shall forthwith report to the nearest police officer, administrative officer, agricultural officer or inspector, and shall state the locality on his land where such eggs have been laid and such other information as may be required and shall use his utmost endeavours to destroy the said eggs by the adoption of such measures as are recommended by an inspector.

As soon as any hoppers shall appear on any land, the occupier thereof shall forthwith.—

(i) report to the nearest police officer, administrative officer, agricultural officer or inspector, and

(ii) use his utmost endeavour to destroy the said hoppers by the adoption of such measures and the use of such materials as are recommended by an inspector.

As soon as any flying locusts shall settle on any land, the occupier thereof shall forthwith use his utmost endeavours to destroy the said flying locusts by the adoption of such measures as are recommended by an inspector.

No person shall wilfully drive or attempt to drive or permit hoppers to be driven on to his neighbour's land. (Colony and Protectorate of Kenya. *Official Gazette Supplement. Kenya Proclamations, Rules and Regulations, No. 29. Supplement No. 32*, Nairobi, August 1, 1939, Vol. XLI, No. 35, pp. 370-373).

* * Government Notice No. 969 of November 17, 1939, declares dodder (*Cuscuta* spp.) to be a pest for the purposes of the Plant Protection Ordinance, 1937 [see this *Bulletin*, 1938, No. 4, pp. 81-82], and amends Government Notice No. 687 of September 2, 1937 [see this *Bulletin*, 1938, No. 4, p. 82], by adding to the Second Schedule thereof, under the heading 'Plant Pests', the dodder. (Colony and Protectorate of Kenya. *Official Gazette Supplement. Kenya Proclamations, Rules and Regulations, No. 35. Supplement No. 49*, Nairobi, November 21, 1939, Vol. XLI, No. 63, p. 885).

* * By Government Notice No. 970 of November 17, 1939, the Schedule to Government Notice No. 688 of September 2, 1937 [see this *Bulletin*, 1938, No. 4, pp. 82-83] is amended by adding the following:—

'17. Seeds of other agricultural crops in excess of 1 lb. by weight in any individual package'. (*Ibid.*, p. 886).

Morocco (French Zone of). — A Decree of November 15, 1939 authorizes the destruction of rabbits which are causing considerable damage to plantations and crops in certain areas in the region around Rabat. (*Bulletin officiel*, Rabat, 1^{er} décembre 1939, XXVIII^e année, n° 1414, p. 1781-1782).

New Zealand. — By Special Order made by the Hauraki Plains County Council on November 8, 1939, and published by the Minister of Agriculture on November 20, 1939, bathurst burr (*Xanthium spinosum*) has been declared to be a noxious weed within the boundaries of the said County. (*The New Zealand Gazette*, Wellington, November 23, 1939, Numb. 140, p. 3143).

Uruguay. — Bv Decree No 572/938 of December 6 1939 Aleppo grass (*Sorghum halepense*) — locally called 'sorgo de Alepo' pasto ruso and pasto polaco — is declared a noxious weed and its destruction is made compulsory (*Diario Oficial de la Republica Oriental del Uruguay*, Montevideo 21 de diciembre de 1939, tomo 137 núm 9990, pag 515-A)

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A Bulgarian text book of forest pathology

This book has the aim of facilitating the recognition of the more common diseases of forest trees for students and forest proprietors. It includes besides an introduction five extensive chapters in which physiological and non parasitic diseases virus diseases bacterial diseases fungal diseases and parasitic flowering plants are treated successively.

The reader requiring further information on specific diseases will find lists of useful bibliographical references at the end of the majority of the descriptions and reference to the present manual is facilitated by two indices in Bulgarian and Latin giving the names of the more common forest trees in both languages and a further two indices giving the subject matter of the book arranged according to the Latin and Bulgarian names.

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NOTES

Thirteenth International Zoological Congress. — This Congress will meet in Paris in July 1940, the exact date being announced later. For further information enquiries should be provisionally addressed to the Secrétariat général de la Société zoologique de la France, Institut océanographique, 195, rue Saint-Jacques, Paris 5°.

Prof. UGO PAPI, *Segretario generale dell'Istituto, Direttore responsabile.*

INTERNATIONAL BULLETIN OF PLANT PROTECTION

DISCOVERIES AND CURRENT EVENTS *

ITALIAN EAST AFRICA.

Movements of the African Migratory Locust †

From June till the end of December, 1939, the desert locust (*Schistocerca gregaria*) has not been reported anywhere in Italian East Africa.

The African migratory locust (*Locusta migratoria migratorioides*) has, on the other hand, been reported frequently and these reports may be summarized month by month as follows:—

In June there were considerable invasions in Somaliland in the neighbourhood of Callafo; in Harar between Dire Dawa and Harar; in Amara near Debarech and Metemma; and in Eritrea between Adi Ugri, Adua and Axum. The predominating direction of the flights observed was from west to east, the locusts leaving eggs in the Alto Ogaden (Gou-Gou), at Errer, in Arussi and in the Residency of Metemma (Amara).

The invasions continued to be of importance in July except in Somaliland where they were limited to the Darror Valley in Migiurtina. Numerous and extensive flights were seen in the district of the Galla lakes, in Uollo Jeggü and particularly in the quadrilateral Decamerè, Adigrat, Adua, Adi Ugri in Eritrea where locusts were reported very frequently in the eastern and western low-lying plains, especially during the second half of the month. From the 10th parallel southwards, the prevailing direction of the flights was from east to west whereas northwards it was almost exclusively west to east. In the zone of Tessenei, the greater part of flights came from the Sudan. Eggs were deposited at Barentù and Coatit in Eritrea and in the neighbourhood of Lake Ruspoli (Ciamò) in Galla and Sidama. Hatching was reported from Gondar, Metemma, Socotà and Olettà.

In the month of August, the invasion had a tendency to diminish in intensity, in fact, no reports were received for Somaliland, the Alto Ogaden and for the territories of Borana and Giam Giam and even for Harar territory they were but few and coming only from Arussi and the Dire Dawa zone. In Galla and Sidama, serious invasions were reported throughout the territory of the Galla

* Under this and the next heading the countries are arranged in French alphabetical order.

† Communication from the Inspectorate of Agriculture, Government General of Italian East Africa, Addis Abeba.

lakes; sporadic flights in the neighbourhood of Addis Abeba and Moggio in Scioa, and in Eritrea in the zone between Adi Ugri, Adua, Axum, Senafè and Alomatà, while in the western low-lying plain, on the other hand, the number of flights was markedly decreased. Egg-laying occurred in the neighbourhood of Dire Dawa at Burgi, Asosa and between Agordat and Adua and hatching took place in the Alto Didessa, the various flights took different directions.

In the month of September, the invasion was still further diminished both in intensity and number; some flights were seen between Adua and Alomatà in Eritrea going towards Lake Tana in Amara, in the Beni Scianguì and in the Lake Margherita zone in Sidamo. Egg-laying took place in the neighbourhood of Adua, in Middle Tacazzè and in western Arussi. No definite direction appeared to be taken.

In October, the number of flights again decreased except in the Galla lakes area. Eggs were deposited in the environs of Gore, by the Giamma River near Ficcè and at Adi Arcai. Hatching took place at Enticciò, Mai-Chenetel, Selacacà, Lake Haik, Uorro Ailù and Bocoggi.

In November, relatively frequent reports were only received from Somaliland, Upper Uebi Scebeli, Giuba and Galla Sidamo rivers, west of the lakes. In the other territories of Italian East Africa, flying having practically finished, hatching began chiefly in Harar (Arussi Giggiga), in Amara (Uorro Ailù), in Eritrea (Enda Sellassiè). Egg-laying occurred north of Baidoa and at Callafo (Somaliland), in western Arussi and in the Ucciali plain (Dessìè). The few flights seen practically all followed a north to south direction.

Little to report in December; chiefly in the upper basin of the Giuba, Uebi Scebeli and the centre valley of the Blue Nile; numerous hatchings, however, near Lugh, Afmedò, Baidoa and Callafo in Somaliland; in Arussi, and on the border of British Somaliland and in Harar.

D a m a g e . With a few exceptions, generally of little importance. Only fairly serious in Amara especially in the Gondar territory, where wheat and barley were attacked, in Derrà (Goggiam), Dembeà, Metemma, where the durra crop was seriously damaged, in Ualdia, Socotà, Quorà and Batiè; in Eritrea at Addi Caieh, Adua, Upper, Mareb, Quoram and Alomatà; in Arussi (Harar); in Scioa at Olettà, Moggio and Biscioftù; in the lake zone and Beni Scianguì area in Galla Sidamo; in the Helai region between Oddur, Baracaba and Baidoa in Somaliland.

C o n t r o l m e a s u r e s . Divisions were established for locust control, efforts being directed chiefly towards the destruction of hoppers and eggs by mechanical and chemical means.

The entomologist of the Experiment Centre is also carrying out investigations in the coastal zone of the Red Sea and in the western low-lying plain of Eritrea with a view to ascertaining eventual outbreak centres.

Considering the extensive area of the territory and the sparse population and the extent of the invasion, the results obtained may be taken as satisfactory.

ARGENTINE REPUBLIC.

***Coryneum carpophilum* on Fruit Trees ***

Miss Clotilde Jauch, Agricultural Engineer in charge of the José C. Paz Phytopathological Laboratory, has just completed an investigation on a disease of stone fruit trees that is commonly called in the country 'viruela de los frutales de carozo'.

She has studied the symptoms in nature and under experimental conditions using pure cultures on peach, apricot, almond, plum, and cherry trees and has determined the damage caused by this disease according to the species of tree attacked as well as the geographic distribution in areas with quite different climates: dry (Mendoza and Río Negro); humid (Buenos Aires, Entre Ríos, Santa Fé and the islands of the Paraná Delta). With regard to the morphological characteristics of the parasite, she has proved that the causal agent belongs to the genus *Coryneum* and on the advice of the writers who are engaged with work on the same fungus she has proposed the name *Coryneum carpophilum* (Lév.) nov. comb.

AUSTRALIA.

Notes on Plant Diseases Recorded in New South Wales during the Year ending June 30, 1839 †

CEREALS AND FIELD CROPS.

Wheat yields were affected more by the incidence of dry weather conditions than by disease. Take-all (*Ophiobolus graminis*) was conspicuous in some crops. Bunt (*Tilletia tritici*) caused some loss in crops grown from untreated or imperfectly dusted seed. Loose smut (*Ustilago tritici*) and leaf spot (*Septoria tritici*) caused unusual damage in some localities. Ergot (*Claviceps paspali*) was again noticeable throughout coastal areas of paspalum. American maize smut (*Ustilago zeae*) was recorded from additional areas in an inland maize area and further action was taken with a view to restricting spread of the disease. Slight losses only were recorded in sugar cane amounting to less than one per cent. of production. Fiji disease (virus), gumming (*Bacterium vasculorum*) and mosaic (virus) were recorded in some areas. Yellow dwarf (virus) of tobacco assumed importance in some areas in which over 80 per cent. infections were

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† Communication from the official correspondent of the Institute, Dr. R. J. NOBLE, Chief Biologist, Department of Agriculture, Sydney, New South Wales, Australia

recorded. Downy mildew (*Peronospora tabacina*) of tobacco, although readily controlled by the benzol vapour method in seedbeds, caused some loss during later growth of the crop. Anthracnose (*Colletotrichum lindemuthianum*) of beans caused loss in susceptible varieties. Halo blight (*Bacterium medicaginis* var. *phaseolicola*) was the most important of the bacterial diseases of beans although there were but few instances of severe infection. Sclerotinia rot (*Sclerotinia libertiana*) affected many coastal crops of beans during moist weather in the early spring. A still further serious attack was recorded in the following autumn and early winter. Sclerotium rot (*Sclerotium rolfsii*) was also of serious importance on beans and other vegetable crops in metropolitan and coastal areas during the early summer. Cercospora leaf blight (*Cercospora carotae*) was reported on carrots for the first time. Macrosporium blight (*Macrosporium carotae*) of carrots was more widespread than usual.

Black rot (*Bacterium campestre*) was the most serious disease of crucifers and caused considerable losses in cauliflowers. Ring spot (*Mycosphaerella brassicicola*) was widespread in its occurrence on cabbages. Spotted wilt (virus) caused loss in lettuce crops and in one area severe yellowing, suggestive of magnesium deficiency, was corrected by the use of dolomite. Defective germination in peas was closely associated with the use of poor quality seed, effective control being obtained by the use of fungicidal dust treatment of the seed. Early blight (*Alternaria solani*) caused unusual loss in potatoes in tableland areas while coastal crops suffered from an outbreak of late blight (*Phytophthora infestans*). Leaf roll was the most commonly observed virus disease affecting potatoes, although spindle tuber was somewhat more prevalent than usual. Leaf mildew (*Cladosporium fulvum*) was again widespread and serious in glasshouse grown tomato crops although effectively controlled in many cases by the adoption of suitable spray programmes. Bacterial canker (*Aplanobacter michiganense*) caused exceptionally heavy losses in many glasshouse tomato crops and was even more severe in its effects on field crops of tomatoes. Other tomato diseases of less importance were Fusarium wilt (*Fusarium lycopersici*), bacterial wilt (*Bacterium solanacearum*), spotted wilt (virus) and big bud (virus). Anthracnose (*Colletotrichum phomoides*) of tomatoes was recorded from an inland irrigation area.

FRUIT CROPS.

Black spot (*Phoma citricarpa*) caused very serious losses in unsprayed Valencia orange crops in coastal areas. Brown spot (undet.) was less serious in mandarins as a result of relatively dry weather in the spring and summer, Autumn rains, however, favoured development of twig lesions. A severe epidemic of brown rot (*Phytophthora palmivora*?) caused damage to nursery citrus trees and internal decline was of importance in lemons. Dry seasonal conditions checked development of black spot (*Venturia inaequalis*) in apples. *Sclerotium rolfsii* was responsible for considerable damage to 4 year old apple trees in one area. An unusual blossom and twig blight in pears was recorded from a number of areas and appeared to be associated with boron deficiency. Brown rot

(*Sclerotinia fructicola*), freckle (*Cladosporium carpophilum*) and rust (*Puccinia pruni-spinosae*) caused some losses in early varieties of stone fruits but subsequent dry weather conditions checked development of these diseases in later varieties. Internal browning (non-parasitic) was not recorded in canning varieties in inland irrigation areas as this year cool showery weather prevailed instead of the high temperatures usually experienced during the last few days of ripening. Bunchy top (virus), although still a menace in banana production was maintained at a low level of incidence through stringent application of eradication measures. Leaf spot (*Cercospora musae*) of bananas was less in evidence during the early summer but later rainy periods led to severe development of the disease and defoliation of plants in the winter. Yellow leaf spot (*Cordana musae*) is now widespread and is the main leaf spot disease of the cooler section of the banana areas. Passion fruit woodiness (virus) continues to be a limiting factor in passion fruit production. Crinkle (virus) is the most important cause of debility and low level of production in strawberries.

MISCELLANEOUS PLANTS.

Nurserymen encountered serious losses from yellows (virus) in anemones and ranunculus. Sclerotinia rot (*Sclerotinia libertiana*) affected many ornamentals and resulted in a most unusual development of disease in Bathurst burr (*Xanthium spinosum*) in one area. Spotting of marigold (*Tagetes*) was caused by *Alternaria* sp. Anthracnose (*Colletotrichum antirrhini*) caused severe losses in unsprayed areas of snapdragons (*Antirrhinum*). Scab (*Sphaceloma violae*) caused reduction in yield of violets grown for commercial purposes.

CHANNEL ISLANDS.

Outbreak of Colorado Beetle in Jersey *

A small outbreak of Colorado beetle (*Leptinotarsa decemlineata*) was discovered in Jersey on October 3rd 1939. Inspection of the whole of the Island has been carried out and no further outbreaks have been found.

The beetles found (43) were all adults and were feeding on volunteer (rogue) potato plants growing among a crop of mangolds. The infested area covers about 1/45 acre.

The methods agreed upon by the International Committee for the Mutual Study of the Control of Colorado Beetle were carried out at once and I hope we shall be fortunate enough to completely eradicate the pest.

* Communication from Dr. THOMAS SMALL, Ph D., M. Sc., A. R. C. S., Mycologist, Experimental Station, Howard Davis Farm, Trinity, Jersey, C. I., transmitted to the Institute by Professor R. MAYNÉ, Secretary General of the International Committee for the Mutual Study of the Control of Colorado Beetle, Boitsfort, Belgium.

SOUTHERN RHODESIA.

Locust Invasion, 1932-1940 *

Monthly Report No. 86. January, 1940.

Winged swarms of the red locust (*Nomadacris septemfasciata*, Serv.) have been reported in various districts during January, and egg deposition has continued in the localities indicated in last month's report.

Egg deposits are also reported in the farming area north of Gatooma and are probably present in much of the country to the west of the railway line between Gatooma and Que Que.

Hoppers hatched out during the month in the following districts, namely, Darwin, Mtoko, Charter, Gutu and Bikita, the first appearance of hoppers having been observed on the 5th of the month. Some hatchings have occurred in the farming area of the Charter district.

Considerable damage, especially to native crops, has occurred in various districts, and at least one European area has sustained a destructive visitation by winged swarms, namely, the Umboe Valley, Lomagundi.

Supplies of poison have been provided in all districts concerned and a campaign against the hoppers is already in progress.

Vast numbers of storks (*Abdimia*) have been observed attacking and destroying the winged swarms in the Gwelo district.

LEGISLATIVE AND ADMINISTRATIVE MEASURES

Germany. — With a view to preventing the spread of the fungus (*Adelopus*) which attacks the needles of the Douglas fir [*Pseudotsuga douglasii*] a Circular of October 3, 1939 advises restricted cultivation of this tree in order to avoid the eventual destruction of the species by the aforesaid fungus. (*Amtliche Pflanzenschutzbestimmungen*, Berlin, 1. Februar 1940, Bd. XII, Nr. I, S. 2-3).

* * In a Circular of October 3, 1939, the Chief of the Forestry Administration gives some information on the above-mentioned disease of the Douglas fir.

This disease which is particularly serious in southern Germany, has not yet been observed in the northern part of the country. Therefore, on no account should seeds and saplings of the Douglas fir from southern Germany be used. The Nurserymen's Association of Germany has advised its members to suspend cultivation of the Douglas fir and not to send any saplings of southern origin to northern Germany. (*Ibid.*, S. 3-4).

* Communication from the official correspondent of the Institute, Mr. RUPERT W. JACK, F. E. S., Chief Entomologist, Agricultural Laboratory, Department of Agriculture, Salisbury, Southern Rhodesia

** By Notification of November 8, 1939, modifying the Decree of February 24, 1939 [see this *Bulletin*, 1940, No. 1, pp. 7-8] indicating the measures to be taken in the control of the Colorado beetle [*Leptinotarsa decemlineata*], the Minister of Agriculture declares that consignments of plants or parts of plants from the Sudeten Territory, the import of which is authorized according to paragraph 14, sub-paragraph 3, of the said Decree, may be sent to Bohemia and Moravia without a compulsory certificate of condition and origin. (*Ibid.*, S. 17).

** A Decree of November 21, 1939, lays down the measures to be taken for the control of the San José scale [*Aspidiotus perniciosus*] in Austria.

In order to prevent the introduction of this scale insect, nurseries for horticultural plants are brought under official control which must take place at least once a year during the period June 15 to October 31. The cultivation of young forest trees and vines is exempted from these regulations.

Nurserymen will not be able to offer plants or parts of plants for sale except after disinfection as laid down by the Minister of Agriculture.

Nurserymen and traders in garden products will have to keep books where facts concerning the origin of their products, their sale and dispatch are to be entered daily. (*Ibid.*, S. 9-10).

** By a Circular of December 14, 1939, relative to the use of phosphuretted hydrogen in the control of the corn weevil [*Calandra granaria*], the conditions laid down by the Circular of September 2, 1936 [see this *Bulletin*, 1937, No. 1, p. 3] to which persons requiring authorization to use this treatment must comply, are slightly modified facilitating the granting of the necessary certificate. (*Ibid.*, S. 4-5).

** By Ordinance of December 18, 1939 by the deputy of the Minister of Agriculture dealing with questions referring to seeds, the regulations relative to trade in seed potatoes [see this *Bulletin*, 1939, No. 5, pp. 110-111] have been slightly modified.

The diameter of the potatoes should not exceed 8 cm (formerly 7 cm.) for the round forms, and 9 cm. (formerly 8 cm.) for the oblong types given in the list of potato varieties published each year by the official Service of the Corporation of Agriculture. (*Ibid.*, S. 2).

** A Notification of December 20, 1939 states that the duties formerly discharged by the Central Station of Plant Protection at Dresden and by the Horticultural Station at Pillnitz are now entrusted to the Plant Protection Service of the Corporation of Agriculture. The Services for plant protection in general and for work on horticultural and fruit crops are established at Dresden, Stübelsee 2, and at Pillnitz, respectively.

The Central Station for the protection of forest species attached to the Higher School of Forestry at Tharandt continues to function as before. (*Nachrichtenblatt für den Deutschen Pflanzenschutzdienst*, Berlin, Anfang Januar 1940, 20. Jahrg, Nr. I, S. 7).

Argentine Republic. — Decree No. 54.521 of February 3, 1940 establishes that the 'Fabrica de Insecticidas y Fungicidas' directed by the Ministry of Agriculture and which will be now known as the 'Fábrica de Productos Químicos del Ministerio de Agricultura de la Nación' will function under the technical and administrative supervision and control of a Commission composed of the Directors of the 'Defensa Agrícola', 'Sanidad Vegetal' and 'Agricultura y Ganadería'.

This Commission will decide the annual working plan of the manufactory and its mode of operation. (*Boletín Oficial de la República Argentina*, Buenos Aires, 20 de febrero de 1940, año XLVIII, núm. 13.662, pág. 1731).

United States of America. — The third revision of the regulations supplemental to Notice of Quarantine No. 64 on account of the Mexican fruit fly (*Anastrepha ludens*), approved on October 10, 1939 and effective on October 16, 1939, adds the counties of Dimmit, La Salle, and Webb, in Texas, to the regulated area because of the discovery of infestation.

The interstate movement of citrus fruits, except lemons [*Citrus limonia*] and sour limes [*C. aurantiifolia*], from the regulated area is submitted to certain restrictions. The movement of non-citrus fruits is prohibited. (*B. E. P. Q.* — Q. 64, [Washington, D. C.], 1939, 5 pp.).

* * The recent finding of pink cotton bollworm [*Pectinophora (Platyedra) gossypiella*] infestations in the vicinity of San Angelo, Texas, and at points in the surrounding area, again necessitates an extension of the regulated area. Under the Amendment No. 3 to the revised regulations supplemental to Notice of Quarantine No. 52, approved on November 15, 1939, and effective on November 20, 1939, there is added the entire Texas counties of Concho, Irion, Mitchell, Sterling and Tom Green, and that part of Coke County lying southwest of, and including, the right-of-way of Highway No. 87. (*B. E. P. Q.* — Q. 52, [Washington, D. C.], 1939, 3 pp.).

France. — A Ministerial Decree of December 27, 1939 fixes the distribution of importers and exporters of vegetable products on the control lists of the Phytopathological Service throughout the six agricultural regions of the country. (*Bulletin de l'Office de Renseignements agricoles*, Paris, 1^{er} février 1940, année 1940, n^o 23, p. 56-57).

Italy. — By Ministerial Decree of February 10, 1940, control of the European corn borer (*Pyrausta nubilalis*) and the maize stalk borer (*Sesamia cretica*) is made compulsory in all provinces of the Kingdom.

Owners or occupiers of maize fields should take the necessary steps so that by April 30 of each year at the latest, all maize stalks have been utilized as stable-litter and then transported to the manure ditch, or else used as fuel or as cattle-feed or in any other manner which ensures the destruction of the caterpillars of

the two above mentioned parasites. This rule also applies to stalks already collected in heaps and to those still in the ground.

The stalks should be uprooted or cut either at or below ground level in such a way that the stumps do not show. Only in exceptional cases, and when authorized by the competent district phytopathological Observatory, can the stalks be dug in by deep ploughing.

Any maize stalks which, after April 30 of each year have not been consumed or employed in any of the ways mentioned above, will be burnt, if already collected in heaps, or cut either at or below ground level and then heaped up and burnt, at the expense of the contraveners who will also be punished according to the provisions of the law in force. (*Bollettino Ufficiale del Ministero dell'Agricoltura e delle Foreste*. Roma, 1º marzo 1940, anno XII, n. 7, pp. 281-283).

* * The Rice-growing Experiment Station of Vercelli, which has carried out investigations for some considerable time on the problem of the disinfection and storage of cereals by physical methods, has obtained practical and satisfactory results with the use of infra-red rays.

Practical and public demonstrations of the methods in question took place in the laboratory of the Station during March, 1940.

Morocco (French Zone of). — The Vizirial Decree of December 30, 1939, (18 kaada 1358) lays down the measures to be taken for the replanting of vineyards attacked by phylloxera. (*Bulletin Officiel*, Rabat, 26 janvier 1940, XXIX^e année, n° 1422, p. 125).

* * A Decree from the Director of Waters and Forests (Directeur des Eaux et Forêts), dated January 12, 1940, authorises the destruction of rabbits that are causing considerable damage to crops and plantations in certain districts in the territory of Port-Lyautey. (*Ibid.*, p. 137).

* * The destruction of rabbits causing damage to crops and plantations in certain zones of the civil administrative area of Karia-ba-Mohammed, Fez, is permitted by a Decree of January 25, 1940. (*Ibid.*, 9 février 1940, n° 1424, p. 176).

Dominican Republic. — Decree No. 453 of November 18, 1939 authorizes the importation of used empty sacks provided that they are dispatched with a certificate of fumigation issued by a competent official of the port of shipment testifying that they have been duly disinfected to ensure the destruction of all germs harmful to seeds. (*Revista de Agricultura*, San Cristóbal, Prov. Trujillo, República Dominicana, noviembre de 1939, vol. XXX, núm. 122, pág. 531).

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[Contains:—
Secume della *Cryptomeria*. [*Cladosporium laricis* on *Cryptomeria* spp.].
Forme imperfette della *Gnomonia veneta* (Sacc. et Speg.) Kleb.
Necrosi del colletto nella *Cineraria*. [*Fusarium conglutinans* var. *callistephi*].
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Maculatura suberosa dei frutti a granella. [A disorder of apples and pears of undetermined origin].

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- In the part which has just appeared the descriptions of the species of the family Aphididae are continued and concluded. This family, of great importance economically, is followed by the Coccidae and finally by the principal species of the order Anoplura.
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NOTES

Seventh International Botanical Congress. — The Organizing Committee of the Seventh International Botanical Congress, which was to be held in Stockholm 1940, has decided to postpone all preparations for the Congress until further notice. This means that there will be no Congress during 1940.

Thirteenth International Zoological Congress. — This Congress which was to have taken place at Paris in June 1940 has been postponed until further notice.

Prof. UGO PAPI, *Segretario generale dell'Istituto, Direttore responsabile.*

INTERNATIONAL BULLETIN OF PLANT PROTECTION

DISCOVERIES AND CURRENT EVENTS *

ITALIAN EAST AFRICA.

Plant Diseases Reported in 1939 †

Owing to the favourable season, wheat rusts (*Puccinia graminis tritici*, *P. glumarum tritici*, *P. rubigo-vera tritici*) the races of which have been studied for the last two years by Professor Cesare Sibilia, have caused serious damage to different indigenous and imported summer wheats, particularly in Scioa and Harar, and also in October and November, 1939.

Appreciable damage was also caused to broad beans by *Uromyces fabae*, to haricot beans by *U. appendiculatus*, and to native flax crops by *Melampsora lini*.

Barley rust (*P. anomala*) and crown rust of oats (*P. coronata*) were less serious, and were only frequent in certain zones (Olettà); the same may be said of the castor rust (*M. ricini*), rust of stone fruits (*Tranzschelia pruni-sbinosae*), sunflower rust (*P. helianthi*).

Losses of economic importance in 1939 were caused by durra smuts, especially *Sphacelotheca sorghi* and *S. cruenta*?

Ustilago avenae, *U. hordei* and *U. tritici*, in order, although observed, were less important.

Among the Erysiphaceae, the most serious was *Oidium crvsiphoides*, which was frequently found on green peas, lupins, broad beans, haricot beans and sesame.

Among the Bacteriaceae, *Pseudomonas malvacearum* was frequent, although only causing slight damage to cotton crops.

Of the non-parasitic diseases reported in Galla Sidama, some cases of sun scald on tea and leaf scorch on coffee, chiefly in unshaded plantations, and only a very few cases of black rust on cotton.

The following fungi were also reported on cultivated plants:—

Plasmopara viticola (Berk. and Curt.) Berl. and De Toni was observed on *Vitis europaea* in the neighbourhood of Addis Abeba.

* Under this and the next heading the countries are arranged in French alphabetical order.

† Communication from Dr. ANTONIO CICCARONE, Plant Pathology Section, 'Centro di sperimentazione agraria e zootecnica per l'A. O. I.', Government General of Italian East Africa, Addis Abeba, transmitted to the Institute by the Ministry for Italian Africa, Rome.

Taphrina deformans (Berk.) Tul. on *Prunus persica* in Scioa and Galla Sidama.

Mycosphaerella sp. on *Manihot glaziovii* in Galla Sidama.

Phyllachora eleusinis Speg. on *Eleusine coracana* in Galla Sidama.

Hemileia vastatrix Berk. and Br. on *Coffea arabica* in Galla Sidama.

Puccinia schweinfurthii (P. Henn.) P. Magn. on *Rhamnus prinoides* in Amara.

Aecidium rhamni Gmel. on *Rh. prinoides* in Scioa.

Phyllosticta manihot Speg. on *Manihot glaziovii* in Galla Sidama.

Phoma theicola Petch on *Thea sinensis* in Galla Sidama.

Septoria lycopersici Speg. on *Lycopersicum esculentum* in Scioa.

Sept. tritici Desm. on *Triticum* spp. in Scioa.

Colletotrichum gloeosporioides Penz. on *Citrus bigaradia* in Galla Sidama.

Pestalozzia theae K. Sawada on *Thea sinensis* in Galla Sidama.

Oidium leucoconium Desm. on *Prunus persica* in Scioa.

O. tabaci Thüm. on *Nicotiana tabacum* in Scioa.

Helminthosporium nodulosum Sacc. on *Eleusine coracana* in Galla Sidama.

On teff (*Eragrostis teff*), besides *Tilletia baldratii* (reported for the second time), the following fungi were observed for the first time:—

Mycosphaerella eragrostidis E. Cast. and Ciccar. in Galla Sidama.

Uromyces eragrostidis Tracy in Eritrea, Amara, Scioa and Galla Sidama.

Phoma depressitheca Bubak in Scioa.

Aposphaeria eragrostidis Ciccar. and F. Cast. in Galla Sidama.

Coniosporium sp. in Galla Sidama.

Cladosporium spp. found to a small extent practically everywhere.

Helminthosporium miyakei Nisikado in Galla Sidama.

Alternaria spp., light infestation everywhere.

The following new species and varieties were also reported:—

Meliola oleicola Doidge var. *jasmini* Ciccar. on *Jasminum abyssinicum* at Ciora, Galla Sidama.

Uncinula sibiliae Ciccar. on *Stereospermum kunthianum* at Giaio, Galla Sidama.

Gnomonia grewiae Ciccar. on *Grewia ferruginea* at Giamba, Galla Sidama.

Ophiobolus syzygii Ciccar. on *Syzygium guineense* at Didessa, Galla Sidama.

Phyllachora gondarensis Ciccar. on *Stephania abyssinica* at Bar Dar, Amara.

Masseella cijerrii Ciccar. on *Berchemia yemensis* at Adamitullo, Galla Sidama.

Phyllosticta gymnosporiae Ciccar. on *Gymnosporia* sp. at Bonga, Galla Sidama.

Phoma balanitis Ciccar. on *Balanites aegyptiaca* at Bolè, Scioa.

Septoria balanitis Ciccar. on *Bal. aegyptiaca* at Bolè, Scioa.

Sept. proteae Ciccar. on *Protea abyssinica* at Didessa, Galla Sidama.

Sept. syzygii Ciccar. on *Syzygium guineense* at Angareb, Amara.

Phleospora olettæ Ciccar. on *Loranthus* sp. at Olettà, Scioa.

Scolecosporium syzygii Ciccar. on *Syzygium guineense* à Omo Bottego, Galla Sidama.

The following diseases, many of which are new to Italian East Africa, were also reported in 1939:—

- Corynelia uberata* Fries on *Podocarpus gracilior*.
Mycosphaerella gardeniae Cooke on *Gardenia lutea*.
Leptosphaeria michottii (Westd.) Sacc. on *Cyperus papyrus*.
Phyllachora bersamae Lingelsh. on *Bersama abyssinica*.
Phyll. cynodontis (Cacc.) Niessl. on *Cynodon* sp.
Endothiella albizziae (Syd.) Syd. on *Albizzia schimperiana*.
Hysterographium graminis Ell. and Ev. on *Hyparrhenia* sp.
Phakopsora erythraea Sacc. on *Stereospermum kunthianum*.
Ravenelia baumiana P. Henn. on *Cassia goratensis*.
Ravenelia sp. on *Acacia laeta*.
Hemileia gardeniae-thumbergiae (P. Henn.) on *Gardenia lutea*.
Hem. hansfordii Syd. on *Jasminum abyssinicum*.
Uromyces aloes (Cke.) P. Magn. on *Aloe* sp.
Ur. cluytiae Kalchbr. and Cooke on *Cluytia lanceolata*.
Ur. geranii (D.C.) Fries on *Geranium* sp.
Ur. hobsoni Vize on *Jasminum floribundum*.
Ur. illotus Arth. and Holw. on *Mucuna rubro-aurantiaca*.
Puccinia abyssinica (P. Henn.) Syd. on *Jasminum abyssinicum*.
Aecidium englerianum P. Henn. and Lindau on *Clematis wightiana* var. *glaucescens*.
Aec. schweinfurthii P. Henn. on *Acacia* sp.
Uredo fici Cast, var. *abyssinica* P. Henn. on *Ficus vallis-choudae*.
Tilletia heterospora (P. Henn.) Zundel on *Setaria* sp.
Graphiola phoenicis (Moug.) Poit. on *Phoenix reclinata*.
Sorosporium healdii Zundel on *Hyparrhenia* sp.
Ustilago linearis (Dozy and Molkenboer) Cif. on *Hyparrhenia cymbaria*.
Ust. vittata Berk. on *Oplismenus compositus*.
Phyllosticta divergens Sacc. on *Albizzia schimperiana*.
Phyll. heveae Zimm. on *Hevea brasiliensis*.
Phyll. stevensii Young on *Triumphetta* sp.
Phyll. visci (Sacc.) Allesch. on *Viscum* sp.
Darluca filum (Biv.) Cast. on different uredo- and teleutosora.
Septoria rosae Desm. on *Rosa abyssinica*.
Pestalozzia caudata Syd. on *Cyperus papyrus*.
Pest. versicolor Speg. on *Protea abyssinica*.
Ovulariopsis erysiphoides Pat. and Hariot on *Erythrina* sp. and *Dodonaea viscosa*.
Oidium erysiphoides Fr. f. *cordiae* Sacc. on *Cordia abyssinica*.
Oidiopsis sicula Scalia on *Tropaeolum* sp.
Periconia pycnospora Fresen. on *Manihot glaziovii*.
Cercospora bauhiniae Syd. on *Bauhinia reticulata*.
Cerebella andropogonis Ces. on *Hyparrhenia rufo*.
Cer. paspali Cooke and Massee on *Cenchrus* sp.

SPAIN.

The Colorado Beetle in 1939 *

The presence of a few foci of *Leptinotarsa decemlineata* ('escarabajo de la patata', 'doriflora' or 'escarabajo del Colorado') in the Pyrenean zone bordering France was reported to the Ministry of Agriculture in 1939.

Up to the present, the damage caused is very slight due to the strict vigilance kept at the frontier, the prohibition of the importation of potatoes, their leaves, peelings, etc. from France since 1933 and the rapid measures taken on the first appearance of the Colorado beetle.

Postcards showing a reproduction of the insect have been issued and distributed in the frontier zones bordering France as also various bulletins to the farmers giving information on the pest and the control measures to be carried out, which consisted in burning of badly infested centres and arsenical spraying of the potato crops.

FRANCE.

Colorado Beetle, 1939 †

On the whole, no heavy invasion of the Colorado beetle (*Leptinotarsa decemlineata*) took place in 1939. In June, however, heavy invasions occurred in Brittany and Normandy and also along the Swiss frontier. Some swarms were noted at the end of May and later about June 10 and July 6.

Beyond the Vosges, where the beetle had crossed the previous years, contamination spread to a varying extent to all the cantons of Bas- and Haut-Rhin, and also to the territory of Belfort.

Invasion was fairly serious in the Haute-Saône, Doubs and Jura. To the south of the Rhone, the Dauphiné plain, infestation was relatively greater than previously and advance into the Alpine valleys had slightly increased. Little advance was made towards Provence. The departments of Alpes-Maritimes and Corsica have remained free of infestation.

SOUTHERN RHODESIA.

Locust Invasion, 1932-40 §

Monthly Report No. 87. February, 1940.

The campaign against the hopper stage of the red locust (*Nomadacris septemfasciata*) has continued during February in the districts mentioned in last month's report, and progress reports indicate that the native crops on the whole are being successfully protected.

* Communication from the Ministry of Agriculture, Madrid, Spain.

† Communication from Dr. JEAN FEYTAUD, Director of the Centre of Phytopathological Research for the South-West, Technical Adviser for the Control of the Colorado Beetle, Talence, Gironde, France.

§ Communication from the official correspondent of the Institute, Mr. RUPERT W. JACK, F. E. S., Chief Entomologist, Agricultural Laboratory, Department of Agriculture, Salisbury, Southern Rhodesia.

Heavy, extensive and continuous hatchings have occurred in the district of Mtoko, which is adjacent to the Mozambique border, and, according to native reports, similar conditions extend for a considerable distance over the border. Elsewhere the hatchings have been lighter.

In all the infested districts the situation is regarded as under control.

LEGISLATIVE AND ADMINISTRATIVE MEASURES

Germany. — By Police Ordinance, dated February 13, 1940, come into force April 1, 1940, the sale of toxic preparations relative to plant protection has been newly regulated.

Firstly, the meaning of 'toxic preparation for plant protection' is defined; in Appendix I these preparations are divided into three groups:—

Group 1: Combinations of arsenic, lead and mercury; nicotine and its compounds (except tobacco extract which does not contain more than 10 per cent. of nicotine and powder preparations not containing over 4 per cent. of nicotine); preparations evolving phosphuretted hydrogen with the exception of certain preparations placed in group 2.

Group 2: Chromic acid and combinations of same; fluorine compounds; nitrocresols and their compounds; preparations evolving phosphuretted hydrogen and not containing over 7 per cent. active combinations; grain bait, the content in strychnine nitrate not exceeding 0.5 per cent.

Group 3: Compounds of barium, cresols (except liquid preparations not containing over 1 per cent. cresol), oxalates, phenols (except preparations not containing more than 3 per cent. phenol, also carbolineums and emulsions with a phenol content not exceeding 10 per cent.), carbon sulphide, tobacco extract containing under 10 per cent. nicotine, zinc salts.

The containers used for the sale of toxic preparations should be strong and hermetically sealed, so that there is no possibility of leakage. They should be labelled as follows:—

- (a) name of product and maker;
- (b) caput mortuum with the word 'poison' in the case of preparations included in groups 1 or 2;
- (c) warning 'use with care' for preparations of group 3;
- (d) exact indication of the contents, clearly showing the nature of the poison included.

Directions for use should also be given.

The indications (a) to (d) should be printed on the cover of the containers, in white letters on a black ground for preparations in group 1 or in red letters on a white ground for those included in groups 2 and 3.

The words 'poison' and 'use with care' should also be shown on the cover and on some other part of the container easily seen. The minimum size of the letters should not be less than 5 mm., and the caput mortuum, 10 mm. (minimum). The containers should not show any illustration or mark other than the maker's trade-mark and the official symbol of authorized control preparations.

Preparations containing lead should carry the warning that their use in viticulture is prohibited.

Poisonous products with no characteristic natural colour should be tinted a distinctive colour: green for arsenical products, blue or red for mercurial preparations, blue or violet for fluorine products.

The products utilized for seed disinfection should contain a colouring matter which shows on the treated seeds.

Grain rendered toxic with strychnine should be tinged dark red.

Toxic products can only be obtained from pharmacies and drug stores authorized to sell poisons.

The proprietors or managers of fertilizer and seed stores, agricultural or horticultural cooperatives, etc. may obtain a sales permit for poisons, after passing a special examination before the Public Health authorities.

Poisonous products should be kept in a special room or in a cupboard or box placed away from food products and fodder. Notices should be posted to this effect.

The products used in control operations can only be supplied to persons giving a guarantee that the said products will only be used for the purpose indicated and that the necessary precautions will be observed. It is prohibited to supply these products to children under 14 years.

The seller may request the customer to present his permit for the purchase of agricultural toxic preparations; an example of this permit is appended to the present Ordinance.

All sales must be entered in a special register, an example of which is also given as an annexe to the present Ordinance. (*Reichgesetzblatt*, Teil I, Berlin, 16. Februar 1940, Nr. 29, S. 349-353).

* * The new edition of police regulations ('*Polizeivorschriften*') published by the German Railway Union includes, in consequence of the changed situation since March 1, 1940, a list of the police ordinances relative to the transport of plants (home and foreign transport). (*Nachrichtenblatt für den Deutschen Pflanzenschutzdienst*, Berlin, Anfang April 1940, 20. Jahrg., Nr. 4, S. 22).

* * By Ministerial Order of March 14, 1940, based on the Decrees of March 28, 1929 and September 30, 1932 [see this *Bulletin*, 1939, No. 6, p. 83; 1932, No. 12, p. 205] with a view to preventing the introduction of the carnation leaf roller [*Tortrix pronubana*] the importation of carnations (cut flowers) is authorized up to April 30, 1940. (*Ibid.*).

* * By Ordinance of March 28, 1940, the Minister of Agriculture exempts fruits sent from abroad by post from inspection for the San José scale [*Aspidiotus perniciosus*] provided that these fruits are dispatched as a gift to the consignee and intended for consumption by same. (*Ibid.*).

* * A research station ('Kartoffelkäfer-Forschungsstation') for work on the Colorado beetle [*Leptinotarsa decemlineata*] has been established at Kruff near Andernach, Mayen district, Rhine Province, Prussia, under the control of the 'Biologische Reichsanstalt für Land-und Forstwirtschaft', Berlin-Dahlem. This new station will specialize in the study of the biology of the Colorado beetle with a view to organizing, improving and simplifying control measures. [Special attention will be given to continuing the experiments carried out during 1936-39 by the Franco-German Station at Ahun, Creuse, France, on the resistance of wild potato plants to the Colorado beetle and on crossing these wild forms with cultivated varieties, and on the insecticides utilizable in the chemical control of this insect. (*Ibid.*, Anfang Mai 1940, Nr. 5, S. 25).

Germany (Eastern Marche). — By a Circular of January 19, 1940, the Minister of Agriculture gives instructions on the application of the Decree of November 21, 1939, relative to the control of the San José scale [*Aspidiotus perniciosus*], [see this *Bulletin*, 1940, No. 5, p. 103].

Any one having fruit trees and other trees and shrubs, which according to the official Plant Protection Service are infested or likely to be infested by the San José scale is required to destroy the trees and shrubs in question if other control measures do not appear to be indicated or if there is serious danger of infestation spreading.

In certain districts which will be delimited by the authorities, those concerned are obliged, during the winter season, to treat their fruit trees, and if necessary, also other trees and shrubs, with preparations authorized by the Plant Protection Service and in accordance with the instructions of an official sent by this Service.

This latter prescription also applies to all usufructuaries of horticultural nurseries in any district. (*Ämtliche Pflanzenschutzbestimmungen*, Berlin, 1. Februar 1940, Bd. XII, Nr. 1, S. 10-11).

England and Wales. — In view on the existence of Colorado beetle [*Leptinotarsa decemlineata*] in Spain, by the Importation of Plants (Amendment) Order, 1940, restrictions have been placed upon the landing in England and Wales of Spanish-grown plants, potatoes, raw vegetables and cider apples. (*The Gardeners' Chronicle*, London, April 27, 1940, Third Series, Vol. CVII, No. 2783, p. 195).

* * With the object of preventing the introduction of the cherry fruit fly [*Rhagoletis cerasi*], the Importation of Raw Cherries Order of 1940, dated May 3, 1940, regulates the importation of cherries grow in Spain, France, Italy and Hungary during the 1940 season. (*Statutory Rules and Orders*, 1940, No. 648, London, 1940, 4 pp.).

Australia (South Australia). — The Act No. 19 assented to November 22, 1939, and which may be cited as the 'Noxious Weeds Act Amendment Act, 1939' amends the Noxious Weeds Act, 1931-1938. (*Anno tertio Georgii VI Regis. A. D. 1939, Adelaide, 1939, 2 pp.*).

Australia (New South Wales). — By Regulation 51 of November 8, 1939, no person shall move or allow or cause to be moved out of any land declared to be a quarantine area on account of the presence or suspected presence of American maize smut (*Ustilago zeae*), any maize or maize plant unless a permit in writing for such movement has first been issued by an inspector. No person shall plant or allow or cause to be planted any maize on any land within a quarantine area unless a permit in writing for such planting has first been issued by an inspector. (*New South Wales. Regulation. Plant Diseases Act, 1924. Sydney, 1939, 1 p.*).

Belgium. — A Ministerial Decree of April 15, 1940 lays down the terms governing the collaboration of the National Office for the marketing of agricultural and horticultural products with the official Phytopathological Service in regard to the sanitary inspection of plant products. (*Moniteur Belge, Bruxelles, 20 avril 1940, 110^e année, n^o III, p. 2416*).

France. — A Ministerial Decree of April 1, 1940 delimits the zones contaminated by the Colorado beetle [*Leptinotarsa decemlineata*] and the protection zones. (*Journal officiel de la République française. Paris, 23 avril 1940, LXXII^e année, n^o 102, p. 2957-2960*).

India. — By Notification No. F. 46-20/38-A of December 6, 1939, in rule 12 of the Order published with the Notification No. F. 320-35-A of July 20, 1936 [see this *Bulletin*, 1937, No. 5, pp. 93-95], after the words 'produced in India', the words 'or in Burma' shall be inserted.

The Fourth Schedule annexed to the said Order is substituted by another and the Fifth Schedule is amended. (*The Indian Journal of Agricultural Science, New Delhi, February, 1940, Vol. X, Pt. I, p. 98*).

* * By Notification No. F. 50-33/39-A of December 7, 1939, in paragraph 4 of the Order above mentioned, for the words 'potatoes and sugarcane' the words 'potatoes, sugarcane and unmanufactured tobacco, either raw or cured', shall be substituted.

Paragraph 8 shall be re-numbered as paragraph 8 A, and after that paragraph as so re-numbered the following paragraph shall be inserted, namely:—

'8B. Unmanufactured tobacco, either raw or cured, shall not be imported into British India, unless, in addition to the general certificate required under rule 5, it is accompanied by an official certificate, that it is free from *Ephesttia elutella* or that the pest does not exist in the country of origin'. (*Ibid.*, p. 99).

Italy. — Ministerial Circular No. 469 of February 22, 1940 relative to the control of the downy mildew of the vine [*Plasmopara viticola*] gives instructions for the economic use of copper preparations by means of suitable sprayers. (*Bollettino Ufficiale del Ministero dell'Agricoltura e delle Foreste*, Roma, 1^o aprile 1940, anno XII, n. 10, pp. 455-457).

* * Two Royal Decrees Nos. 197 and 198 of February 29, 1940 ratify the curricula for the the biennial courses to be held at the Agricultural Section of Technical Institute for colonial agriculture, attached to the Royal Agonomic Institute for Italian Africa [see this *Bulletin*, 1940, No. 3, pp. 57-58]. (*Gazzetta Ufficiale del Regno d'Italia*, Roma, 11 aprile 1940, anno 81^o, n. 86, pp. 1302-1315).

* * By Ministerial Decree of April 22, 1940, a competition on the basis of qualifications and written examinations was opened for the award of twelve scholarships for advanced study in plant pathology and agricultural entomology at the Royal Institutes of Phytopathological Research and Experimentation and at the Royal Observatories for Plant Diseases. (*Ibid.*, 7 maggio 1940, n. 107, p. 1684).

Switzerland. — A Decree of the Federal Council, dated February 16, 1940, modifying the Decree of the Federal Council of April 17, 1938 [see this *Bulletin*, 1938, No. 8, p. 176] in regard to the control of the potato wart disease [*Synchytrium endobioticum*] and the Colorado beetle [*Leptinotarsa decemlineata*] lays down that as a general rule the Confederation will reimburse to the canton and the communes two-thirds of the expenses incurred in the control of the potato wart disease and the Colorado beetle, if control measures were carried out by order of the Agricultural Division of the Federal Department of Public Economy.

Moreover, the Confederation may: (a) reduce, by means of a subsidy, the selling price of the products required for the compulsory treatment against the Colorado beetle; (b) grant a subsidy of 20 per cent. (maximum), 40 per cent. (maximum) in the mountain areas, in order to facilitate the purchase of the machinery and apparatus employed in the control of the Colorado beetle.

The Department of Public Economy may authorize the Agricultural Division to fix and to limit the amount of compensation to be given for the destruction of infested crops or harvests.

In regard to interdiction of potato cultivation on land contaminated by wart disease, no compensation is allowed. (*Recueil des lois fédérales*, Berne, 21 février 1940, tome 56, n^o 8, p. 181-182).

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PLANT PROTECTION

